UNIVERSITY OF CAPE COAST

EFFECT OF COGNITIVE BEHAVIOURAL AND INTERPERSONAL THERAPIES IN ACHIEVING IMPLANTATION IN INFERTILE DEPRESSED WOMEN IN GREATER ACCRA

NANA YAW OSEI

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BY

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Thesis submitted to the Department of Guidance and Counselling of the Faculty of Educational Foundations, College of Education Studies, University of Cape Coast, in partial fulfilment of the requirements for the award of Doctor of Philosophy degree in Guidance and Counselling

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DECLARATION

Candidate's Declaration

I hereby declare that this thesis is the result of my own original research and that no part of it has been presented for another degree in this university or elsewhere.

Candidate's Signature:..... Date:.....

Name:…….

Supervisors' Declaration

We hereby declare that the preparation and presentation of the thesis were supervised in accordance with the guidelines on supervision of thesis laid down by the University of Cape Coast.

Principal Supervisor's Signature:..... Date:.....

Name:……

Co-Supervisor's Signature: ..... Date:.....

Name:……..

ABSTRACT

The study's main goal was to determine if cognitive behavioural therapy (CBT) and interpersonal psychotherapy (IPT) could help infertile depressed women achieve significantly higher implantation. The study used a true-experimental design. All infertile women on the register of 37 Military Hospital in Accra from September 2021 to November 2021 numbering 106, were included in the study. Using purposive sampling technique and random assignment approach, 45 of the said women were selected for the study with 15 being placed in each of CBT, IPT and control groups. The Beck's Depression Inventory II was utilised for baseline data as well as post-test scores, while a self-developed questionnaire was used for the implantation data. Each of the CBT and IPT groups was taken through 12 sessions of therapy after which all the women in the two groups as well as those in the control group went through In-Vitro Fertilisation (IVF) treatment. The two-way ANOVA, one-way ANOVA and logistic regression were employed to analyse the data. The findings conveyed that women who are experiencing infertility suffer from depression, and that CBT and IPT significantly helped them reduce their depressive levels. Also, infertile women who experienced CBT achieved significantly higher implantation than those who were taken through IPT. Finally, it was revealed that demographic variables do not predict the depression levels of infertile women. The Ministry of Health and the Ghana Health Service should ensure that counselling plays an important role in fertility treatments. Also, counsellors should be knowledgeable about CBT and IPT and be able to use them to treat depression in infertile women.

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DEDICATION

To my son, Nana Opoku Onyinah Osei.

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LIST OF ABBREVIATIONS

ART	Assisted Reproductive Technology
AT	Automatic Thought
CBT	Cognitive-Behavioural Therapy
CR	Cognitive Restructuring
CT	Cognitive Theory/Therapy
ET	Embryo Transfer
GFS	Ghana Fertility Survey
GHS	Ghana Health Service
GIFT	Gamete Intra Fallopian Transfer
HCG	Human Chorionic Gonadotropin
IPT	Interpersonal Psychotherapy
IVF	In vitro fertilisation
MDD	Major Depressive Disorder
PID	Pelvic Inflammatory Disease
REBT	Rational Emotive Behaviour Therapy
STIs	Sexually Transmitted Infections
UCC	University of Cape Coast
WHO	World Health Organisation
ZIFT	Zygote intra-fallopian transfer

CHAPTER ONE

INTRODUCTION

Infertility and its associated problems (psychosocial, financial, sexual, risk with treatments, etc.) are enormous for the affected people particularly women across the globe and in Ghana in particular. Inability for couples to bear a child in the earlier years of marriage in Ghana raises a lot of concern between the couples themselves and among significant others in their lives. The stigma associated with childlessness in Ghana is so high that couples, especially women, battling with infertility do all they can to get at least one child even in situations where such women have been declared unfit medically to bear a child. Many studies have revealed the presence of psychological issues including depression among women confronted with infertility which impact on their ability to achieve a pregnancy (Fatemeh, Majid, Paria, & Seyyed, 2004; Bhatti & Jeffery, 2012). Studies also show that once the depression levels of infertile women are reduced through counselling or other means of psychological support, implantation or pregnancy rate goes up (Facchinetti, Tarabusi, Volpe, 2004; Volgsten et al., 2010). This study therefore looked at the effect two counselling therapies, Cognitive Behavioural Therapy (CBT) and Interpersonal Psychotherapy (IPT) would have on the depression levels of infertile women and whether a possible reduction in their depression levels could lead to higher implantation.

Background to the Study

An infertile woman's suffering is equivalent to a chronic disease or AIDS (Domar, Clapp, Freizinger, Kessel, Orav, & Slawsby, 2000). The lack of a feeling of fertility and the popular responses in society lead to the foundation for many psychological pressures (Fatemeh, Majid, Paria, & Seyyed, 2004).

The American Society for Reproductive Medicine (2013) narrates infertility as a result of a male or female reproductive tract disease (body functions' disorder or cessation, interruption, organs or processes) that inhibits the conception of a child or the ability to bear a pregnancy (ASRM, 2013). The World Health Organisation (WHO) estimates that infertility affects forty-eight (48) million couples and one hundred and eighty-six (186) million people worldwide (WHO, 2020). Men and women may both be faced with infertility issues, though infertility is more prevalent in women (Sadock & Sadock, 2000).

Infertility comes in two basic forms – primary infertility and also secondary infertility. Women who have never been pregnant are considered as facing primary infertility while secondary infertility refers to women who have been pregnant at least once previously. As a result of these definitions for primary and secondary infertility where a woman's ability to become pregnant is used, women face the blame even when the fault is not theirs (Bhatti & Jeffery, 2012).

Depression has been found to abound in infertile couples through various studies. A child's absence between a couple afflicts infertile women with the dilemma of anxiety (Seibele, 1997) which has adverse effect on the physiological functioning of the couple in general and women in particular, as well as on the

outcome of fertility treatments. Infertility increases anxiety and creates unstable menstrual cycles that inhibit the ability of the couple to achieve pregnancy (Karimzadeh, 1996).

Depression has been linked to lower success rates with fertility treatment in cross-sectional studies (Volgsten et al., 2010). Infertile women frequently consider infertility the most stress-generating occurrence in their lives and characterise the prolonged and continuous cycles of fertility treatment as reoccurring cycles of the crisis (Rojuei, 1997). Anxiety also increases as infertility duration increases. Anxiety is greater in older infertile women and those with only diploma training or less (Lion, 2002).

Different individuals and institutions across the globe who have embarked on some research on infertile women as well as medical and community groups have recommended counselling for infertile couples. Psychoanalytic theory, CBT, Rational Emotive Behaviour Therapy (REBT), IPT, stress reduction and problem solving are some of the psychological theories and techniques that have been applied in this respect (Boivin & Takefman, 1995). CBT is high among them; it helps to alleviate depression and anxiety, and seeks to boost the quality of life and fertility rates (Facchinetti, Tarabusi, Volpe, 2004). Antidepressants, CBT, and IPT have also been shown to be successful therapies for severe depression (Elkin et al., 1989).

Domar, Clapp, Slawsby, Dusek, Kessel, and Freizenger (2000) showed that using CBT on infertile women decreases depression and anxiety. Cognitive behavioural interventions talk about the fact that thoughts and behaviours are

intertwined and that cognitions are antecedents of emotional reactions. The intellect of a person (i.e. thoughts), emotions and behaviours are all related and affect each other. Cognition also tends to be the result of emotional state and the interaction between cognition and emotion will be reciprocal (Teasdale, 1997).

CBT is described as a fairly short-term therapy by Hewstone, Fincham and Foster (2005). Putting it differently, therapists of CBT concentrate on the patients' cognitive as well as affective experiences more. According to Meichenbaum (1993), Cognitive-behavioural therapists aim to alter perceptions, improve coping mechanisms, increase self-control and facilitate self-reflexion. The use of CBT encompasses the different techniques of breathing, muscle relaxation, cognitive rehabilitation, biological input, daily desensitisation, physical exercise and stopping thinking (Hawton, 2008; Saeedeh, Shohreh, Javad, Mohammad, & Mohammad, 2011). Furthermore, Hemberg, Roth and Winnie (2002) endorse CBT's efficacy as a very dynamic therapy, which is adaptable to both group and individual settings since it has been practiced in different contexts by children, adolescents and adults. Moreover, several studies have proposed the use of CBT, which requires different approaches, including cognitive rehabilitation, relaxation, biofeedback, behavioural therapy, systemic desensitisation, and thinking avoidance, to help deal with emotional difficulties (Stuart & Laaraia, 1996).

Apart from CBT, the only other short-term, semi structured psychotherapy prescribed in depression treatment guidelines is IPT (Segal et al., 2001). IPT's efficacy in depression treatments has been demonstrated in a lot of trials, clinically (Mufson et al., 1999). Guidelines in evidence-based practice recommend IPT as a

first-line remedy for major depressive disorder [MDD] (Workgroup on Major Depressive Disorder, 2010). The systemic overview of the three phases of IPT treatment—the purveying of an interpersonal concept of depression, the description of a problem region, and the employment of concrete strategies to strengthen interpersonal interactions beyond the clinical environment, thereby minimising the patient's depressive symptoms—sets the IPT method apart from a support group (Klier et al. 2001). For treating mild to moderately severe depression, individual IPT has been demonstrated to be as effective as medicine (Elkin et al., 1989). If determined to be equally successful, a group approach can be more economical. Group setting encourages participants to meet other women who are dealing with similar issues, normalising their experiences as new mothers. Individuals' feelings of shame associated with this condition may be reduced by participating in a community, as well as their sense of isolation (Klier et al. 2001).

The choice of IPT as the other therapy for the research was because it has been exhibited to be efficacious in treating major depression (Elkin et al., 1989; Stuart & Hara, 1995; Mufson et al., 1999; Weissman et al., 1994) and because it focuses on interpersonal relationships, which specifically addresses the issues that depressed infertile women face (Stuart & Harra, 1995). Therapists of IPT look for the patient's current experiences in their life, the "here and now" issues, rather than difficulties they experienced in the past or childhood. Neither do IPT therapists focus on cognitions as CBT does. Also, Weissman, Markowitz and Klerman (2018) stated that an impartial Guidelines Development Committee of the WHO accepted

the following guidelines for the treatment of moderate up to severe depression in 2015, among other things:

1. Psychological interventions such as CBT, behavioural activation and IPT, as well as antidepressant medication, may be used as first-line cure.

2. For women who are pregnant and those breastfeeding who experience moderate up to severe depression, as well as adults having mild depressive disorder, WHO (2015) endorses results-oriented psychological therapies like IPT and CBT as the first-choice treatment. This necessitates the availability of IPT or CBT all across the world.

The majority of IPT conversions were created and tried out in developed countries: Canada, the United States, Australia, Japan, and a few European countries (Verdelietal., 2003). Bolton, Neugebauer and Ndogoni (2002) considered CBT and IPT when choosing a substantiated depression psychotherapy since both can be delivered in a social setting. CBT, according to Bolton and colleagues, was too foreign to most Sub-Saharan African cultures' problem-solving approach. People in these cultures are more likely to see themselves as members of a family or collective unit than as individuals. As a result, IPT-G proved to be a more appropriate solution (Verdeli et al., 2003).

Boateng (2015) states that there is a rise in infertility cases in Ghana and it is important to unearth it. Estimations based on data from the 1979/1980 Ghana Fertility Survey (GFS) showed that the overall fertility rate ranged from 6.85 to 6.99 children per woman for the period from the 1960s to the mid-1970s. The

assessment and modification of the data for the duration (1975-1980) resulted in a total fertility rate of 6.69 compared to a recorded fertility rate of 6.470 (Gaisie, 2005). All told, figures derived from data sets spanning more than 25 years indicate that during the 1960s, 1970s and early 1980s, the degree of fertility was high and steady. The recorded total fertility rates from the Demographic and Health Surveys of 1993, 1998 and 2003 suggest a substantial and steady decrease in fertility since then, dropping from 6.43 in 1988 to 5.50 in 1993, 4.55 in 1998 and then to 4.44 in 2003 (Gaisie, 2005). The stigma associated with infertility leads to other mental issues that cause infertility. The situation is worse for young couples in Ghana. Young couples, especially women, are under tremendous pressure for conception. Within months of marriage, a failure to conceive leads to acute problems that can lead to depression. This study, therefore, was aimed at the effect CBT and IPT would have on the depression levels of women facing infertility and whether a possible reduction in such depression levels, if any, could result in higher implantation.

Statement of the Problem

Studies show that psychological distress abounds in women seeking care for infertility (Domar, 2004; Bhatti & Jeffery, 2012). Also, anxiety, stress and depression are suspected to affect fertility, as it has been demonstrated that treatments for some psychological conditions increase the degree of pregnancy or implantation among depressed infertile women (Park, 2000; Cousineau, 2004). Michelson and Marchion (1991) are of the opinion that the first step in the treatment of infertile couples must always be CBT as it has been proven to be very effective

in the treatment of depression among such groups. More recent research works have also confirmed this idea (Choobforoushzade, Kalantari, & Molayi, 2010; Hamid, 2011). Although there seem to be few trials of IPT for infertile women with depression, interpersonal counselling, a variation of IPT, was found to be successful in minimising depressive symptoms in women who are depressed non-clinically and who were confronted with miscarriage issues (Neugebauer et al. 2007). Since IPT focuses on interpersonal stressors, it could be an appropriate therapy for depression that is accompanied by infertility. Since infertility takes place in a social context, women with infertility face interpersonal events that can exacerbate depressive symptoms, such as disputes with spouses or significant others in their lives (Newton et al. 1990; Hunt & Monach 1997). Hence IPT's emphasis on improving social supports is important. It has been proposed that IPT needs little modification for infertile women who are depressed, possibly because the types of events in life that IPT tackles are similar to those that occur in the social conditions of infertility (Koszycki et al., 2012).

Infertility keeps growing and shows no signs of deceleration (American Society for Reproductive Medicine, 2013). Research from cultures in African such as Gambia, Mozambique, Egypt and Nigeria, revealed that permission is not granted to women with infertility to be part of social activities (Gerrits, 2007; Sundby, 2007). This has the tendency of making infertile women in such cultures go through psychological distress which include anxiety and depression. In Africa, the generality of depression among infertile women have been detailed to be very high. For instance in Nigeria, it is reported to be 52.7% (Oladeji & OlaOlorun,

2017), in Uganda, it is 44.3% (Lukenge, 2019) and in Ghana, it is reported to be 62.0% (Alhassan, Ziblim & Muntaka, 2014).

In the Ghanaian community, if couples are not able to have children, more problems confront infertile women in particular and the stigma they face is greater in some societies to the degree that such women are scorned and marginalised socially (Dyer, Abrahams, Lombard, Mokoena & van der Spuy, 2005). In lieu of social stigmatisation, infertile women in Ghana face psychological upsets, disorders and depression (Alhassan, Ziblim, & Muntaka, 2014). Third-party use of Assisted Reproductive Technology treatments may make people more nervous as some couples facing infertility may need to resort to receiving donor eggs, donor sperm, donor embryos, and surrogacy arrangements before they can have children. As the number of men and women facing infertility problems rise with potential increases in donor gamete use (egg, sperm and embryo), how infertility impacts the mental wellbeing needs to be discussed. Therefore, it is crucial that clinicians become aware of how infertility can adversely affect individual's mental health. Despite findings that depression affects infertile women more and thus generates worse fertility treatment results than women who are not depressed, there appears to be little research on treating disorders of depression in infertility context (Koszycki et al., 2012).

In Ghana, Fledderjohann (2012) discovered that women confronted with infertility faced a couple of issues psychologically which include stress, anxiety and depression. Other research works in Ghana also show that anxiety and depression are real in such women (Alhassan et al., 2014; Naab et al., 201). The

effectiveness of psychotherapy-based treatments in lowering depressive symptoms has been documented in several randomised controlled trials in wealthy countries (Jané-Llopis et al, 2003). Its trials in less developed countries including Ghana, on the other hand, are scarce and tend to be based in clinics rather than community (Sumathipala et al, 2000; Patel et al, 2003; Araya et al, 2003). It is, therefore, not surprising that the effect of CBT and IPT in achieving implantation in depressed infertile women are still little known. Also, even though it has been documented that anxiety and depression increase as the duration of infertility increases and such psychological issues are greater in older infertile women and those with only diploma training or less (Lion, 2002), little is known about the effect CBT and IPT would have on the depression levels of infertile women considering those demographic variables (age, duration of marriage and educational qualification). The research was, therefore, done to bridge this void or gap. Anecdotal records show that women with infertility in Ghana view themselves as being stigmatised and thus go through enormous pain in trying to seek help from different quarters. This includes the use of orthodox and conventional medicines that could have an effect on their depression levels and thereby reduce implantation. Therefore, it was imperative to investigate whether CBT and IPT could help reduce the depression levels of infertile women in Ghana and ascertain whether such a reduction could lead to higher implantation among the women. CBT and IPT belong to two different categories of the counselling theories and they are the only short-term, semi structured psychotherapies prescribed in depression treatment guidelines (Segal et al., 2001) and have been used extensively to address depression among infertile

women across the world. Hence, the decision to use the two therapies out of the many psychotherapies.

Purpose of the Study

The study's key purpose was to assess if the use of CBT and IPT could lead to a significantly elevated level of implantation among depressed infertile women in Ghana.

In specific terms, the research was aimed at achieving the following objectives:

1. Ascertain whether depression levels among women with infertility in the experimental (CBT and IPT) and control groups are similar at the pre-test stage.
2. Find out the influence demographic characteristics (age, duration of marriage and educational qualification) have on the depression mean scores of women experiencing infertility at the pre-test era.
3. Compare the post-test depression levels of infertile women in the CBT and IPT groups with their counterpart in the control group.
4. Find out the influence of demographic characteristics on depression mean scores of infertile women in the therapy groups at post-test.
5. Compare the implantations among infertile women in the CBT and IPT groups with their control group.
6. Ascertain differences in implantations between infertile women taken through CBT and those taken through IPT.
7. To discover the relationship between depression level of infertile women and implantation.

Research Hypotheses

For the purposes of this study, the hypotheses below were tested to guide the performance of the study:

$H_0$1: There is no significant difference in the pre-test depression mean scores of infertile women in CBT, IPT and Control groups on the basis of:

a. *Age*
b. *Length of Marriage and*
c. *Educational Qualification*.

H_A1: There is significant difference in the pre-test depression mean scores of infertile women in the CBT, IPT and Control groups on the basis of:

a. *Age*
b. *Length of Marriage and*
c. *Educational Qualification*

$H_0$2: There is no significant difference in the post-test depression mean scores of infertile women in CBT, IPT and Control groups on the basis of:

a. *Age*
b. *Length of Marriage and*
c. *Educational Qualification*.

H_A2: There is significant difference in the post-test depression mean scores of infertile women in the CBT, IPT and Control groups on the basis of:

a. *Age*

b. *Length of Marriage and*

c. *Educational Qualification*

H_03: There is no significant difference in achieving implantation among depressed infertile women taken through CBT, IPT and their counterpart in the control group.

H_A3: There is significant difference in achieving implantation among depressed infertile women taken through CBT, IPT and their counterpart in the control group.

H_04: There is no relationship between depression levels and achieving implantation among infertile women.

H_A4: There is relationship between depression levels and achieving implantation among infertile women.

Significance of the Study

The results of the study would hopefully enable counsellors, psychologists, family life educators, etc. collaborate with doctors and social workers to help infertile women medically. Counsellors, psychologists, family life educators, etc. may rely on the results to help infertile women deal with any psychological, particularly depressive issues they may have as a result of their predicament (infertility). Married couples especially those confronted with infertility, including

the respondents of the study, would hopefully see the need to seek counselling to help address their issue holistically as a result of this study.

Also, in cases where third parties may be involved in fertility treatments, a counsellor/psychologist may be able to support couples to deal with the implications. Government and other stakeholders may be able, on account of the results of this study, to see the need to integrate infertility treatment with therapy and come up with hospital and clinic policies and regulations to follow.

Finally, the study will be used as a resource by other researchers and, ideally, will advance our understanding of infertility care.

The researcher hopes to disseminate the findings of the study to target beneficiaries through scientific publications as well as any pertinent medium. Apart from participants of the study, people and institutions that can best make use of the results of the study e.g. hospitals, scientific community and policymakers for instance the Ministry of Health, Ghana Health Service and the Ghana Education Service will be given copies for possible review of the health policy and curricular to give a place for fertility counselling. Finally, the researcher hopes to make presentations both locally and internationally with the findings of the study to draw people's attention to comprehensive infertility care with high premium on fertility counselling.

Delimitations

One region, Greater Accra Region, in Ghana was used for this study. The Region has the capital city of Ghana and the largest hospital in the country. Most of the top public hospitals and referral centres in Ghana including the 37 Military

Hospital which was used for the study are situated in the Greater Accra Region and so significant number of the Ghanaian citizenry including infertile women attend hospitals there.

Also, only infertile women who went to the 37 Military hospital in the said Region for fertility care were part of the research. It included infertile women who came to the said hospital for fertility care from the other regions of Ghana and from abroad.

Finally, in determining the effect of CBT and IPT in this research, the study was also delimited to achieving implantation in depressed infertile women.

Limitations

Some of the infertile women were not able to afford the cost of the fertility treatment which could help ascertain their implantation levels and so were dropped. Efforts were made to have further discussions with authorities of City of Hope Medical Complex (where the fertility treatment was made) on the need to reduce the cost of the treatment. Even though some rebate had earlier been given to the infertile women because of the importance of the research, some could still not afford it. A few other infertile women who fulfilled the selection criteria including their ability to pay for the treatment were also dropped in order to have sizeable groups (15 each). It might be challenging to generalise the research's findings due to the study's tiny sample size. The proper statistical tools were used to remedy this issue, though.

Definition of Terms

CBT: This is a form of psychotherapy that educates patients how to recognise and swap unhelpful or disturbing thought patterns that negatively impact their emotions and behaviour. In this study, CBT was used as one of the therapies to help address the depressive levels of 15 infertile women.

Depression: A disorder affecting the mood, body and thoughts negatively and impacts on the way a person sleeps, eats, feels about himself, and thinks about issues.

Implantation: This occurs when a developing embryo, travelling through the uterus as a blastocyst, makes contact with the uterine wall and remains linked to it until birth. Implantation signifies the beginning of conception. Light bleeding, cramps, nausea, bloating, headaches, sore breasts, mood changes, and a change in basal body temperature are all possible symptoms.

Infertile Woman: A woman who is unable to get, or ineffective in getting pregnant in at least one year of having regular unprotected sex.

IPT: It is a short, attachment-focused psychotherapy that focuses on relationship issues and symptomatic rehabilitation. In this study, IPT was the second therapy used on 15 depressed infertile women to help alleviate their depressive levels.

Organisation of the Study

The study covered five chapters. Chapter One dealt with the introductory aspect covering the background among others.

In Chapter Two, the conceptual review, the theoretical and empirical literature as well as the views of writers related to the research were discussed.

Chapter Three described the methodology adopted. Specifically, the research design, population, among others were examined.

In Chapter Four the results of the study were presented and thoroughly discussed while Chapter Five covered summary, conclusions and recommendations.

CHAPTER TWO

LITERATURE REVIEW

The literature review chapter covered the theoretical framework, the conceptual review and the empirical review which involves experimental and non-experimental studies on infertile depressed women seeking fertility treatment, how age, length of marriage and educational attainment affect their fertility levels, among other things.

Theoretical Framework

The theories involved in this research were Cognitive-Behavioural Theory (CBT) and Interpersonal Psychotherapy (IPT).

Cognitive-Behavioural Therapy

Cognitive Theory/Therapy (CT), also known as Cognitive-Behavioural Theory/Therapy (CBT) was promulgated by Aaron Beck (Mills, Reiss, & Dombeck, 2008). The phrases "cognitive therapy" (CT) and the general word "cognitive-behavioural therapy" (CBT) are also used to describe cognitive-based psychotherapies as synonyms. Cognitive therapy concentrates on the human being's emotional condition, which Beck says is known as cognition (Gladding, 2009). According to Beck, cognition refers to feelings, opinions, perceptions and interpretations given about the person and the environment they find themselves in. It might also talk about yourself and others, too, as well as the future. For a

collection of techniques in which a cognitive approach and series of behavioural procedures are integrated, the word 'cognitive-behavioural therapy' is often used.

The definition of thoughts as they contribute to acts can be tracked down to Epictetus (55 AD -135 AD, the Greek Philosopher and Stoic) who stated that, “Men are not disturbed by things, but by the view which they take of them” (Epictetus & Higginson, 1944). CT is based on the cognitive model, which indicate that thoughts, feelings and actions are all related, and that by understanding and altering unhelpful or incorrect thought, individuals can advance towards overcoming problems and achieving their objectives, dysfunctional behaviour, and emotional responses that are distressing. This involves the client engaging in partnership with the therapist to develop skills to test and alter perceptions, recognise skewed thinking, connect in different ways with others, and change behaviours. The cognitive therapist constructs a personalised cognitive case conceptualisation as a guide to understand the internal experience of the client, pick effective treatments and define areas of distress.

Assumptions

Adapted from Dobson and Dozios (2001), the following assumptions underlie cognitive-behavioural therapy:

1. Thoughts and behaviour are linked. Infertile woman’s thoughts have a link with the way she behaves.
2. Cognition is a major determinant of behaviour and feelings. Infertile woman’s cognition makes her behave in a way which aggravates her situation making her depressed.

Basic Concepts

The fundamental values expressed in Cognitive Therapy include the following:

Cognitive Schema (s): Aaron Beck, as cited by Neukrug (2011), Cognitive schema was originally defined as a structure for coding, evaluating and screening the stimuli affecting the organism. It is the basic fundamental way in which people process data about themselves, others, the environment and the future. They are the mental constructs that are used to process the data around us. For instance, an infertile woman may think that her situation is beyond control.

Genesis of Schemas: Genetic or biological forces interact with the environment to form schemas. During early childhood, they grow as people communicate with the ambience. Children start to develop ideas about themselves, others and the world during this time, and these shape their personality. Schemes give rise to core beliefs and intermediate beliefs, which will create automatic thoughts in turn.

Core Beliefs: Core values are one of the most critical self-conceptions (Beck, 1995). They are convictions that people hold about others, themselves and the world. They are emphatic claims or categorical ones. Aaron and Judith Beck (Beck, 2005) indicate that three large categories of core beliefs are: helplessness, unlovability and worthlessness, as mentioned below:

Core Beliefs that are Helpless

“I am insufficient, inefficient, incompetent; I am unable to cope."

“I am impotent, out of control; I am unable to change; I am stuck, trapped, a victim."

"I am fragile, weak, in need, susceptible to harm. “I am inferior, a failure, a loser, not good, enough; I do not measure myself against others."

Unlovable Core Beliefs

"I have little to offer, I am unlikable, unacceptable, ugly, boring. I am unloved undesirable, ignored”.

“I shall always be rejected, forsaken; I shall always be alone as an infertile woman. I'm different, flawed, not good enough to be cherished."

Core Beliefs that are Worthless

"I'm useless, cruel, mad, nothing.

"I am harmful, dangerous, poisonous, bad”

“I do not deserve a living."

An infertile woman may think that because she does not have a child, she is worthless and therefore does not deserve to live.

Intermediate Beliefs

The kinds of behaviours, laws, aspirations and assumptions we have in life are influenced by our core beliefs. These are considered our intermediate convictions by Beck (Neukrug, 2011). They are the rules and theories that we make out of core beliefs. They are mainly statements that are conditional. They are very static sentences, inflexible ones. It seems they are claims of truth. The following are examples:

"There's no reason for me to seek recourse if the infertility in my life is beyond repair".

"If I don't like people, then I'm a loser".

Automatic Thoughts

The ongoing thoughts we have that cut into our heads as we go through the day are automatic thoughts. They are thoughts that happen naturally without choice or efforts that occur in response to event so circumstances. They are the most available thoughts and work at the level of consciousness. Others are adverse, and others are positive, but they are always negative or maladaptive (Hope, Burns, H yes, Herbert & Warner, 2010). For instance, an infertile woman may be filled with anxiety, depression, guilt and other negative emotions.

Figure 1: Levels/Layers of Cognition
Adapted from: Beck, (1995)

As a way of relating the layers of cognition to the researcher's work, an infertile woman may be filled with depression (automatic thought) arising out of her intermediate belief of not finding the need to seek redress because her core belief is that her situation/infertility is beyond control. It is important to remember that the same order follows both adaptive and maladaptive thinking.

Cognitive Distortions/Errors

There may be some distortions in the layers of consciousness and these distortions are called cognitive distortions or cognitive mistakes. They are flaws in

the processing of knowledge or mistakes in our reasoning (Gladding, 2009). The distortions are based on the cognition layers. Sometimes, they are logical, but not fair. They are dangerous, maladaptive and impractical feelings, according to Beck (1995). With one's thought, they can generate actual difficulty. One experiences a cognitive triad when there is depression,

Figure 2: Triad
Source: Beck, (1976)

The person here has a pessimistic view of himself/herself, the future and the world. An infertile woman may have a pessimistic view about herself and may feel that she is being stigmatised by the world and therefore not have any hope in the future. Below, as adapted from Beck (1995), is a few of the most common cognitive distortions:

All-or-nothing thinking: In black and white categories, one sees stuff. An individual sees themselves as a complete failure if their performance fails to reach perfect. Seeing oneself as useless when faced with infertility, for instance.

Mental filter: An individual picks out a sole negative feature and concentrate solely on it so that their view of all real life, like the drop of ink that discolours the entire water beaker, becomes darkened. Infertility facing women typically speak

about social strain when their own parents discuss with them issues related to childbearing rather than seeing it as problems shown by those parents.

Disqualifying the positive: By insisting that they "do not count" for one reason or another, one denies positive experiences. An individual holds a negative perception which their daily experiences contradict. In terms of their education jobs, among others, some women facing infertility do not recognise the progress being made in life, but may focus too much on their childlessness.

Jumping to conclusions: While no definitive facts convincingly support an individual's conclusion, one offers a negative interpretation. Many women confronted with infertility who see their neighbours laughing from afar can infer that those neighbours laugh at them. The researcher attests to this because many of the participants involved, especially during the therapy sessions, expressed worry over people stigmatising and laughing at them.

Goal of Therapy

In order to alleviate psychological dysfunction, the primary purpose of counselling is to remove maladaptive impulses (Beck, 1995). In other words, in order to attain emotional and behavioural stability, it is to adjust, substitute or change maladaptive thoughts with adaptive thoughts (Dryden & Ellis, 2001). This is called Cognitive Restructuring (CR) process.

By developing more optimistic and functional thinking patterns, cognitive restructuring (CR) aims to help people alleviate their tension (Mills, Reiss, & Dombeck, 2008). A central strategy in CBT is Cognitive Restructuring. It is a therapeutic tool used to recognise and confront negative patterns of thought and to

help people realise that these thoughts are counterproductive or harmful, with the intention of modifying negative behaviours eventually. This shows patients not to think otherwise by substituting more sensible and constructive forms of thinking for harmful and illogical thoughts ("faulty thinking"). As a therapeutic method for CBT and REBT, cognitive restructuring was first introduced (Mills, Reiss & Dombeck, 2008).

It was soon realised by CBT practitioners that it was an adaptable and versatile method that could help a wide variety of people cope with all sorts of issues, whether the issues were due to external causes, internal problems, or both. The majority of CBT sessions is made up of this form of solving issues and facilitating healing, and provides hundreds of strategies and activities that can be applied to almost every client situation (Mind Resources Content Team, n.d.). Properly applied, it will help the consumer learn to avoid trusting his or her thoughts automatically as a reflection of fact and start checking his or her thoughts for accuracy (Mills, Reiss, & Dombeck, 2008). CR utilises multiple techniques, such as Socratic interrogation, recording of thoughts, and directed imagery.

There are four phases involved in cognitive restructuring (Hope, Burns, Hyes, Herbert & Warner, 2010), which are as follows:

1. Identification of unhealthy cognitions refereed to as 'automatic thinking' (ATs) based on current perceptions about oneself, the environment, or the future that are dysfunctional or pessimistic impressions about oneself, the environment, or the future (Gladding, 2009).
2. Recognising the cognitive distortions in the AT.

3. Fair contention of AT with the Socratic approach
4. Creation of a reasonable Rebuttal against the ATs

As mentioned below, there are six forms of ATs (Hope, Burns, Hyes, Herbert & Warner, 2010):

1. Thoughts self-evaluated
2. Thoughts on others' judgments
3. Evaluative feelings about the other person they associate with
4. Thoughts on methods for coping and behavioural plans
5. Avoidance reflections
6. All other thoughts which have not been categorised

In trying to substitute irrational and skewed feelings with realistic ones, a therapist can support the patient. In the use of CR-based treatments, a variety of studies show significant efficacy (Cooper & Steered, 1995; Taylor, Anderson, McLean, Koch, Paterson & Woody, 1997; Harvey, Inglis & Espied, 2002).

The Therapeutic Process

First, the therapist or psychologist deals with the automatic ideas and then defines and changes the central and intermediate values that are the underlying variables. Cognitive therapy is a phase and can therefore not be completed in a day to produce the positive results that are expected. This includes a series of sessions. There can be counselling in either client or group sessions, and similar to conventional psychotherapy, the course of treatment is short. The process of therapy is split into three (3) phases namely, *initial/beginning, middle and ending*/*last* phase (Wenzel et al., 2011).

Initial Phase: This includes the development of relationships and discussion of therapist/counsellor and client positions, stressing teamwork. Teach the customer about automatic thinking and mental, behavioural and physiological responses as well. Expose the client to the simple cognitive model in short. Giving the client homework to encourage him or her to recognise, track and assess the validity of automatic thoughts.

Middle Phase: Therapy requires the recognition and alteration of central and intermediate values underlying automatic thought and the predisposition of individuals to participate in dysfunctional thought. Empiricism and directed methods of discovery (e.g. Socratic questioning) are employed during this stage. The client may have learned adaptive or functional thought by the end of the middle period.

Ending/Last Phase: The last step of therapy focuses on avoiding relapse and encouraging the client to act as their own therapist.

Interpersonal Psychotherapy (IPT)

In the early 1980s, the late Gerald Klerman and Myrna Weissman founded IPT as an intervention for a series of experiments on the evaluation and treatment of depression that they were performing. Centered on the hypothesis that most psychological conditions arise in a social setting, the findings of these research works influenced the creation of an IPT manual.

Weissman et al (2000) narrate IPT as follows:

IPT is a concentrated, time-limited therapy that emphasises the connection between a depressed client's mood and his or her current interpersonal relationships,

while also acknowledging genetic involvement as well as developmental, physiological and personality components in the cause and susceptibility to depression. The IPT therapist is encouraged to consider the depression's interpersonal meaning as well as the significance of the depression's underlying roots of connection, bonding, tension, and interpersonal conflicts.

IPT is a short, formal psychotherapeutic technique focused on the assumption that psychological problems arise in a social, interpersonal sense (Weissman et al, 2000). Interpersonal conflicts, role changes, grief, and interpersonal deficiencies are four areas of social functioning where symptoms of psychological conditions cause difficulties with which therapists operating with IPT are coached to intervene.

Interpersonal Disputes: Such conflicts can arise in a number of situations, including family, social, marital, school, and workplace conflicts. They usually occur when people have different perceptions of a situation. These forms of conflicts are worth resolving in counselling if they cause serious distress.

Role Transitions: This refers to a shift in circumstances, such as a career change, a change in relationship status, or a life event that necessitates adaptation. These improvements can feel like defeats, which can lead to depression or anxiety. An infertile woman’s situation falls squarely under role transitions which also talk about medical illnesses.

Grief: Grief and sadness are common emotions when someone close to you passes away. If your grief is delayed, or if it lasts longer than the 'usual' period for bereavement, it's something you can talk about in therapy.

Interpersonal Deficits: Relationships that one knows weaken him/her in some way, or relationships that an individual does not have, fall into this category. This may be due to a strained relationship with a sibling or a lack of trustworthy friends. IPT therapy will assist an individual in identifying and overcoming these deficits (Pomerantz, 2008). Table 1 further gives a summary of the four focused areas of IPT.

Table 1: *IPT Problem Areas*

Problem Area	Life Situation
Grief	*Complicated grief after a significant other's passing*
Role Dispute	*Struggle, a dispute with a partner, lover, husband, child, other relative, acquaintance, or co-worker*
Role Transition	*Life changes include getting a new career, leaving one's family, divorcing, moving, buying a new home, retiring, getting sick, and immigrating.*
Interpersonal Deficits	*None of the aforementioned acute life events. Lack of emotional ties, solitude, social exclusion, and boredom.*

Source: Weissman, Markowitz & Klerman, 2018

Some of the underlying approaches of IPT were influenced by the work of three psychopathology theorists (Weissman et al., 2000; Klerman et al., 1984). Harry S. Sullivan is regarded among the most influential personalities in the field of psychiatry in the United States. Sullivan's fundamental hypothesis is that psychological disorders are caused by interpersonal interactions and the communications that occur within them. “Each individual in a two-person relationship is involved as a portion of an interpersonal field, rather than as a separate entity, in processes that affect and are affected by the field,” (Sullivan, 1953, p. xii).

The dedication in which Klerman and Weissman later developed IPT stems from their understanding of the need for studies to show the effectiveness of novel therapeutic treatments. IPT is a relationship therapy that focuses on current social and interpersonal experiences. Right relationships with others and with oneself arise as a result of interpersonal transition. The IPT model focuses on interpersonal relations, or self-other interactions (Klerman et al., 1984; Weissman et al., 2000; Barry, 2002). IPT's thrust is to figure out how the depressed occurrences arose in the interpersonal context and how they associate with the current personal and social situation.

Assumptions

IPT is based on John Bowlby's (1980) work which identified disturbances in the maternal to child relationship as a cause of psychosocial problems in adolescence as well as adulthood. Bowlby's study focused on the importance of problems in early life, such as loss and separation, as the root cause of depression. Founders of IPT based their developmental studies on Bowlby's theoretical insights and Sullivan and Meyer's social interaction theories. Psychopathology results from latent personality disorders may not be the subject of therapy, according to IPT. Instead, IPT stresses the interdependence of the issues caused by psychological disorders in the conscious social and interpersonal domains. The emphasis of IPT therapy is on these issues and conscious understanding of the context (ISIP, 2006).

The manifestation of depressive affect as well as its associated signs, which could be the product of psychodynamic or psychobiologic mechanisms, are referred to as *symptoms* (ISIP, 2006). Interactions of social roles with others are

referred to as *social and interpersonal relations.* "Reassurance, clarification of emotional states, enhancement of interpersonal communication, and testing of expectations and success by interpersonal contact" are used to solve these interactive social problems (Klerman et al., 1984, p. 7). The researcher noted during the therapy sessions that interactions/communications infertile women make with and the kind of interpretations (usually perceived) given to statements by some significant others in their lives contribute significantly to their depressive levels

Basic Concepts/Principles

Peplau is credited with establishing mental health nursing field (Fawcett, 1986). IPT's foundational principles are compatible with models created by Hildegard Peplau. The role of interpersonal relationships in nursing is a key principle. The belief that clinical knowledge and scientific evidence obtained through "carefully planned, well-controlled investigative trials" could direct progress in developing new clinical interventions drove the development of IPT (Weissman et al., 2000, p. 4).

IPT, which was created to research successful therapies for depression, focuses on the social causes of depression. Over the twentieth century, mental health studies strongly suggested that social influences play a role in depression development (Weissman et al., 2000).

The three main aspects of depression were the driving force behind the creation of IPT (Weissman, Markowitz & Klerman, 2018):

1. Symptom function: how does the patient's depressed mood and neurovegetative signs and symptoms impact him or her directly and socially?
2. Interpersonal and social relationships: how an individual communicates with others as a result of early childhood interactions, social reinforcement taking place currently, and a sense of mastery.
3. Character and personality flaws: pessimism, low self-esteem, anger, and weak interpersonal communication are examples of character flaws.

The first two causes of depression are actively addressed by IPT. The third source, personality and character issues, are commonly regarded as having their roots in the memory at the unconscious level and they are deep-seated (Weissman et al., 2000). While IPT does not specifically discuss this aspect of character and personality aspects, Weissman claims that constructive practice on the first and second points, interpersonal functioning and symptom characteristics, encourage the creation of new social skills that can help to alleviate some of the typical personality problems.

In comparison to other psychotherapy models, the IPT method (Weissman et al., 2000) has the following summarised characteristics:

1. Not long term. has limited time,
2. Not open ended, focused,
3. Not past relationships, based on current,
4. Not intrapsychic, interpersonal in nature,

5. Not cognitive or behavioural, interpersonal,

6. Awareness of personality, however, not concentrated on it

Goals of Therapy

IPT's aim is to intermediate with symptoms and minimise the likelihood of new ones by addressing existing interpersonal and social adjustment issues (Pomerantz, 2008). Weissman, Markowitz and Klerman (2018) stated the following as the goals of IPT:

1. To minimise depression symptoms and
2. To assist the patient in dealing more effectively with events and individuals related with the arrival of symptoms.

Therapeutic Techniques

IPT places a strong prominence on the patient's existing social and interpersonal conflicts, frustrations, anxieties, and ambitions (Klerman et al., 1984). Here are some of the several approaches:

- **Identification of your emotions** - It can be difficult for some of us to correctly define the emotion we're experiencing. An individual is assisted in identifying feelings from a standpoint that is neutral.
- **Expression of emotion** - It involves assisting individuals to express their feelings in a healthier manner.
- **Dealing with issues from the past** - Relationships from the past can often influence how you communicate in the present. Looking back at the experience to see if any trends have developed can be a part of your therapy (Pomerantz, 2008).

In addition to decision analysis, role play and communication analysis, Weissman, Markowitz and Klerman (2018) gave the following techniques as pertaining to IPT:

1. **Nondirective Exploration**: This method employs open-ended inquiries to encourage unrestricted debate and the identification of problem areas. “Who are the most significant persons in your life?” is one example of a question.
2. **Direct Elicitation**: Use direct elicitation of material to get specific information, such as to construct the interpersonal inventory, to get symptoms to make a diagnosis, or to demonstrate a point, such as describing a patient's involvement in a dispute or an unexpressed affect. For example, “How did you feel after realising that your husband is the cause of your inability to have a child?”
3. **Encouragement of Affect**: Encouragement of affect aids the patient's ability to express, comprehend, and manage affect. Affect expression may assist her in determining what is essential to her and making emotionally meaningful changes. If the patient does not identify the range and strength of her sentiments concerning critical interpersonal circumstances, making choices and changes becomes more challenging. Reflecting on a sense of guilt, wrath, or despair might assist to clarify and point the patient in the right way in terms of interpersonal relationships.
4. **Clarification**: Clarifying a subject that a patient has expressed can help the patient become more conscious of how she is interacting or communicating. It is possible to ask patients to repeat or rephrase what they have stated. “Do

you mean to indicate that you would like your husband to use a donor sperm?" a therapist could ask, pointing out the logical extension of the patient's statement.

The Therapeutic Process

Just like CBT, IPT also goes through three (3) phases in the therapeutic process as follows:

Initial Phase: This includes promoting the medical model of depression as a supplement to infertility, encouraging the therapeutic partnership, and delivering depression psychoeducation.

Middle Phase: This step focuses on resolving the established issue (e.g., adapting to the loss of reproductive capacity), normalising affect, and developing social supports and skills.

Ending/Last Phase: This stage of therapy focuses on emotions about being terminated from care, reviewing treatment progress, and developing techniques for dealing with potential interpersonal stressors.

Conceptual Review

Concepts of infertility and depression, as well as the conceptual framework were the issues that were discussed under this section because they formed the main concepts underlying the study.

Concept of Infertility

Infertility is described as the failure to conceive after one year of routine unprotected sexual intercourse (Seshadiri, 2011). From Johnson (2003), infertility

is said to exist if after one year of engaging in unprotected coitus, a pregnancy has not occurred.

Infertility prevalence in different parts of the world ranges significantly from below 5 percent to beyond 30 percent (Stoleru. Set al, 1993). Ombelet, Devroey, Cooke, Dyer, and Serous (2008) stated that infertility is faced by at least 70 million couples globally, with majority coming from the developing world. Cwiek, Wozniak, Fryc, Grochans and Rygielska (2009), in their research on self-care and social help for Women with infertility, stated that the prevalence of infertility among married couples has been increasing. The projected infertility of every fifth married couples in Poland is by Malhotra (2013). It is assumed that 10% of the general inhabitants in India experience some sort of infertility.

Primary occurrence of infertility was highlighted by Demographic and Health Survey (2000). The incidence in sub-Saharan African countries, like Togo, was 23.5 percent, 19.2 percent in Ghana and 18.1 percent in Cameroon. The incidence in West Asian countries was 42.2 percent, like Morocco, and 33.1 percent in Turkey. It was 20.7 percent in Latin American countries, such as Colombia, in Haiti, it was 18.8 per cent, 18.3 percent in Brazil and 15.7 per cent in Peru.

Causes of Infertility

Infertility has a wide variety of causes that come from three Primary sources: neurological conditions, causes that can be avoided, and unknown problems (Lee et al., 2006). Erectile dysfunction, semen abnormalities and ejaculatory dysfunction are all examples of neurological disorders in men that can lead to infertility. For females, some neurological conditions that cause infertility

are tubal obstruction, abnormal ovulation and endometriosis (Lee et al., 2006). Causes that can be avoided include smoking and drinking. Due to physiological conditions, illness, lifestyle components, progressing maternal age, and occupational and environmental threats, unexplained male or female infertility may be induced (Daar & Merali, 2002). These causes are mostly discussed by considering female factors separately from male factors as detailed below:

Female Infertility

Causes and Factors

Fallopian tube obstruction: A significant cause of infertility in female is tubes that are blocked. Blocked Fallopian tubes are unable to allow the sperm and the ovum to intersect, making it difficult to fertilise. Oviducts and uterine tubes are often referred to as Fallopian Tubes. In developing nations, most primary and secondary infertility is from infectious diseases which eventually cause destruction or blockage to the fallopian tubes (Vayena et al., 2002). Blockage in the tube is believed to account for up to two thirds of infertility (Vayena et al., 2009). In a retrospective assessment of 289 infertile women who had hysterosalpingography (HSG) in Kampala utilising ionic water-soluble contrast medium, Kiguli-Malwadde (2004) discovered that tubal obstruction was mostly the common origin of infertility among the sample.

Pelvic inflammatory disease (PID): An expression used to characterise any infection that spreads to the upper female reproductive tract from the lower part is PID. The vagina and the cervix consist of the lower female genital tract. The upper

part comprises the uterine body, the uterine or fallopian tubes, and the ovaries (Guven, Dilek, Pata, Dilek, & Ciragil, 2007).

Infertility due to infection can be caused by post-abortion infections, genital tract infections, postpartum or STIs, that are undiagnosed or poorly treated. Sexually transmitted infections, particularly gonorrhoea and chlamydia are the most common preventable causes of infertility (Butler & Khanna, 2003; Fidler & Bernstein, 1999). They often show little, if any, noticeable symptoms, with the possibility that they may not seek adequate care in time to avoid reduced fertility (Wilson, Mottram, & Vassilas, 2008). These are among the most readily transmitted STIs, with one in every two unprotected interactions with an infected partner leading to transmission of gonorrhoea and one in five unprotected interactions with an infected partner leading to transmission of Chlamydia (Evens, 2004). Although the prevalence of chlamydia infection is estimated to be between two percent and twenty-seven percent of sexually active women, the true prevalence of chlamydia is uncertain and almost definitely underreported (Fidler & Bernstein, 1999). These STIs may have a significant effect on fertility on a population scale;

Swinton et. al, (1992) estimate that a twenty percent occurrence of untreated gonorrhoea in sexually active adults will decrease population growth by up to fifty percent due to infertility induced by infection (Daar & Merali, 2002). The good thing is, screening will classify these two diseases and both can be handled effectively (Evens, 2004). Chlamydia and gonorrhoea in women, undiagnosed or inadequately treated, can lead to PID that can lead to infertility. Chronic chlamydial

genital infection can also contribute to infertility in males (World Health Organisation, 2001).

Forty (40) percent of women in developing countries with Chlamydia that are not treated properly grow PID, with tubal scarring affecting 20 percent of those who become infertile. In developed countries, these rates may be higher, (Fidler & Bernstein, 1999). When the occurrence and prevalence of these STIs is considered, the potential for Chlamydia and Gonorrhoea to lead to infertility rates is startling. It is estimated globally that sixty-two million cases of gonorrhoea and ninety-two million cases of genital chlamydia will cause infertility every year (Evens, 2004).

Anovulation: A menstrual period during which the ovaries do not release an oocyte is an anovulatory period. Ovulation, thus, should not take place. A woman who does not ovulate during each menstrual cycle, however, does not generally go through menopause. A common cause of infertility is chronic anovulation.

P***oor Ovarian Reserve:*** Is a low fertility disorder characterised by 1): low remaining oocyte numbers in the ovaries or 2) likely impaired prenatal oocyte production Function before the age of forty years.

Endometriosis: Anatomical adhesions and distortions may result from endometriosis (Tomassetti et al., 2006). However, where the degree of endometriosis is limited, the relation between infertility and endometriosis remains elusive (Speroff & Fritz, 2005).

Polycystic ovary syndrome (PCOS): PCOS is a complex, heterogeneous condition of unclear etiology, although there is good evidence that it can be identified as a genetic disease to a large extent (Diamanti-Kandarakis, Kandarakis, & Legro,

2006; Fauser et al., 2011). In approximately 5 percent to 10 percent of women in their reproductive age, PCOS produces symptoms that lead to subfertility (12 to 45 years old).

Age: The fertility of a woman is affected by her age. In the developing world, an increasingly common cause of infertility is advancing maternal age. The quality of eggs and ovulatory function decreases as maternal age rises, while the risk of reproductive disorders such as endometriosis rises (Fidler & Bernstein, 1999).

***Tobacco smoking*:** Smoking tobacco results in damages to the woman's ovaries, and the extent of harm depends on the amount & period of time that a woman smokes or she is subjected to a smoke-filled atmosphere. "Lifestyle factors" include other preventable causes of infertility such as eating disorders, malnutrition, weight gain and loss, physical exercise, caffeine usage, alcohol, and nicotine. Although these variables are important, their influence on infertility is significantly lower than that of infection (Fidler & Bernstein, 1999).

Body weight and eating disorder: 12% of all cases of infertility stem from a female being either overweight or she may be underweight. Fat cells develop estrogen (Nelson & Bulun, 2001). Excess body fat allows excess estrogen to be released. The body starts responding like it were a birth control and this reduces the chances of becoming pregnant. Not enough fat in the body induces inadequate estrogen development and menstrual cycle interruption. There are abnormal periods in both situations and ovulation fails to occur or is ineffective. Proper nutrition is also a significant factor in later fertility in early life (Sloboda, Hickey, & Hart, 2011). In Koning et al., (2010), it was ascertained that obese and overweight sub-fertile

women had a lower risk of success with fertility treatment and that more complications and higher costs are associated with their pregnancies.

Menopause: Menopause is an occurrence that usually happens in women who have attained midlife, are in their late 40s or within early 50s, but not always. It signifies the conclusion a woman's reproductive era. This indicates that the ovaries (eggs) of the woman are totally depleted.

Ovarian cancer: A cancerous development originating from the ovary is ovarian cancer. Early on, signs are sometimes very subtle, including: bloating, pelvic pain, trouble eating and frequent urination, and are frequently mistaken with other diseases (Johannes, 2012).

Uterine fibroid: This is a smooth muscle tissue leiomyoma (benign non-cancerous) tumor that originates in the uterus's smooth muscle layer (myometrium). They can develop and cause urinary frequency and urgency, heavy and painful menstruation, painful sexual intercourse, whereas most fibroids are asymptomatic. Even though this appears to be very rare, some fibroids may interfere with pregnancy (Neiger , Sonek , Croom & Ventolini 2006).

Male Infertility

Even though the thesis is about infertile women, it is important to discuss male infertility at this stage since pregnancy does not come from only one gender and moreover implantation issues are involved in the study. Male infertility relates to a male's failure to achieve a fertile female pregnancy. It takes a portion of forty to fifty percent of infertility in humans (Brugh, Matschke, & Lipshultz, 2004). Male infertility is mostly attributed to semen defects, and the consistency of semen is

used as a proxy indicator of male fertility (Cooperetal. 2010). The counts in sperms, motility, quality; and ejaculatory dysfunctions include male causes.

Factors linked to infertility for men include (Rowe & Comhaire, 2000):

Tobacco smoking: Male smokers also have a higher infertility rate of around 30 percent. There is growing evidence that tobacco-smoking destroy sperm cells (Agarwal, Prabakaran, & Said, 2005).

Testicular factors: Testicular factors apply to conditions where, despite adequate hormonal support, the tests yield semen with low or poor parameters.

Age: Evidence suggests that a decrease in sperm motility, semen volume, & sperm morphology is correlated with increased male age (Sarrel & DeCherney, 1985). Comparisons between men under thirty and men above 50 showed relative decreases in pregnancy rates between twenty-three percent and thirty-eight percent in studies that accounted for female age (Sarrel & DeCherney, 1985). The sperm count decreases with age, leading to male infertility, as seen below:

90 percent of the seminiferous tubules produce mature sperm in males twenty to thirty-nine years old.

50 percent of the seminiferous tubules produce mature sperm in males forty to sixty-nine years old.

10 percent of the seminiferous tubules produce mature sperm in males eighty years old and older (Schmidt, Tjrnhj-Thomsen, Boivin, & Nyboe Andersen, 2005).

V***aricocele:*** An irregular enlargement of the pampiniform venous plexus in the scrotum is the varicocele or varicose seal. The testicles are drained by this plexus of veins. Varicocele is confirmed to be present in about 35 percent of men having

primary infertility and 81% of men who have secondary infertility. This disparity was highly important in the occurrence of varicocele (Shu, 2003).

Testicular cancer: Cancer which develops in the testicles is cancer. The risk of testicular cancer in humans is around 1 in 250 (0.4 percent). In men aged 20-39 years, it is the most common cancer (Levitas et al., 2006).

Other causes of infertility include environmental and occupational hazards even though how these affect fertility is not defined properly and is difficult to calculate. However, in the workplace and environment, there are more than 50 substances that are known to be associated with adverse reproductive effects in men and women (Fidler & Bernstein, 1999). There is also a substantial risk of additional harmful chemical-related harms; about sixty thousand chemicals and four million chemical mixtures have been checked for reproductive effects in industrial use today (Fidler & Bernstein, 1999).

Several professions are associated with substantially higher infertility rates and exposure to contaminants such as glycol ethers, nitrous oxide, organic solvents, pesticides, soil fumigants, aflatoxins, arsenic, and endocrine disruptors such as dichlorodiphenyltrichloroethane (DDT), polychlorinated biphenyls (PCBs) and dioxins (Fidler & Bernstein, 1999). Environmental exposure to reproductive toxicants can impact far more people than toxicants found in particular workplace environments, as people can come into contact with chemicals in a number of ways, including: industrial pollution, direct exposure, pesticides and their residues, polluted water or food consumed (Fidler & Bernstein, 1999).

The above-mentioned causes of infertility are ingrained in the Western bio-medical model, but infertility in each socio-cultural context in which it is encountered is understood differently. Traditional awareness recognises both male and female causes of infertility in Anglophone Africa, but men are shielded and almost always women blamed for involuntary childlessness (Gijsels, Mgalla, & Wambura, 2001; WHO, 2001). Powerful social stigma linked to infertility and machismo attitudes creates an environment in Latin America where women blame themselves for infertility (Luna, 2002). Largely and commonly, women are blamed and sometimes seen as revenge on the part of the man, woman or one's ancestors for past wrongdoing (Qiu, 2002).

While there are some global parallels in infertility attitudes, such as the pervasive notion that women are generally responsible for unwanted childlessness, there is also difference in presumed cause and significance (Van Balen & Inhorn, 2002). In around 10 to 30 percent of couples, a combined cause of infertility is found (Jones & Toner, 1993; Honeap et. al., 1991).

Malhotra (2004) indicated that infertility is a mixture of both among 20 percent couples and, ultimately, the cause of infertility is idiopathic among 10 percent cases. When there is no apparent abnormality, Mahajan (2004) states that it is idiopathic. According to Lashen (2004), Idiopathic infertility has been shown to cause considerable discomfort for couples. Emotional disturbances can act to prevent conception in many infertile women who cannot discover such an organic defect. Wischmann, Stammer, Scherg, Gerhard and Verres (2001) in their research, stressed that 27 percent of the sample had idiopathic infertility. Smith (2009) In

San-Francisco, the United States of America, studied to identify the sexual, social and marital effects of a man's assumed diagnosis of infertility. No male factor was recorded among 357 men with 47 percent; independent male factor 12 percent; factors combined in female and male 16 percent; while 25 percent were present with unexplained infertility.

The studies cited attest to the fact that infertility is a major social problem and the people affected go through emotional disturbances that need to be tackled, especially for women.

Concept of Depression

The word "depression" (known in Latin as “deprimere”: to force down) became popular gradually in the 18th century (Jackson, 1986). Despondency is a key factor for depression in various ways. Depressive ataxia diagnosis is based on the self-attested experiences of the patient, behaviour reported by family or associates, and an assessment of mental state. For physical disorders that can cause similar symptoms, physicians normally order tests. If depressive disorder is not identified in the early stages, it can lead to a slow recovery and affect the physical health of the person or make it worse.

Usually, a person with a depressive episode goes through feelings of worthlessness, helplessness, hopelessness, and self-hatred, or contemplate over them. Signs of insanity may be experienced by depressed persons in extreme cases which include delusions or, less often, hallucinations that are typically unpleasant (APA, 2000).

Bad memory and concentration (especially those with psychotic or melancholic characteristics), withdrawal from activities and social situations, decreased sex desire, and suicide or thoughts of death are other symptoms of depression (Delgado & Schillerstrom, 2009). For those depressed, insomnia is popular. An individual in the usual pattern, experiences insomnia which can also involve trouble falling asleep. A minimum of 80 percent of depressed people are affected by insomnia. Hypersomnia or oversleeping may also occur, affecting 15 percent of depressed individuals (APA, 2000). David et al., (2009) assessed clients who were depressed and found out that they are easy to realise that they are useless or a disappointment, but are less able to quickly assess what demand they struggle to meet.

Several physical manifestations such as headaches, fatigue, etc. can be identified by a depressed person; Physical remonstrance are the most common appearance, according to the criteria for depression of the World Health Organisation (Patel, Abas, Broadhead, Todd, & Reeler, 2001). Appetite sometimes decreases, with weight loss resulting, although there is often increased appetite and weight gain (APA, 2000). The presence and persistence of depression tends to be central to different aspects of personality and development (Andrews & Henderson, 2000), as a typical Precursor of negative emotionality (Morris, Bylsma, & Rottenberg, 2009).

While depressive episodes are closely associated with traumatic events, the typical coping style of a person can be correlated with his or her resilience (Sadock, Kaplan, & Sadock, 2007). Human depression is analogous to laboratory animals,

which, although they are able to escape, stay in uncomfortable circumstances, but not because they originally learned that they had no control (Seligman, 1975). Depression, or melancholia, can be attributed to interpersonal failure from the classic psychoanalytic viewpoint (Carhart-Harris, Mayberg, Malizia, & Nutt, 2008) experiences of and early childhood (Radden, 2003)

Psychotherapy/Counselling, medicine, and electroconvulsive therapy are the three eminent depression therapies. Psychotherapy and medicine combination can be used for more composite and persistent depression forms. (Thase, 1999).

Prevalence of depression

A significant cause of morbidity worldwide is depression. The lifetime prevalence ranges widely from 3 percent to 17 percent. Sufferers of depression range from 8 to 12 percent in most countries (Andrade et al., 2003). The likelihood of a depressive episode over the course of a year is 3 to 5 percent for men and 8 to 10 percent for women (Kessleretal., 2005).

Depression has been consistently shown by population research to be around twice as frequent in women as in men, even though it is indeterminate why this is the case and whether unrecognised elements contribute to this (Kuehner, 2003). Research also shows that couple undergoing care for fertility have 15 percent to 54 percent depression prevalence. Both infertility and the treatments associated with it can cause depression and anxiety as emotionally stressful conditions (Hammarberg & Fisher, 2007). Many research works have revealed depression prevalence in infertile women across the world particularly infertile women in Africa including Ghana.

Conceptual Framework

From the foregoing therefore, the following conceptual framework was generated to buttress the study:

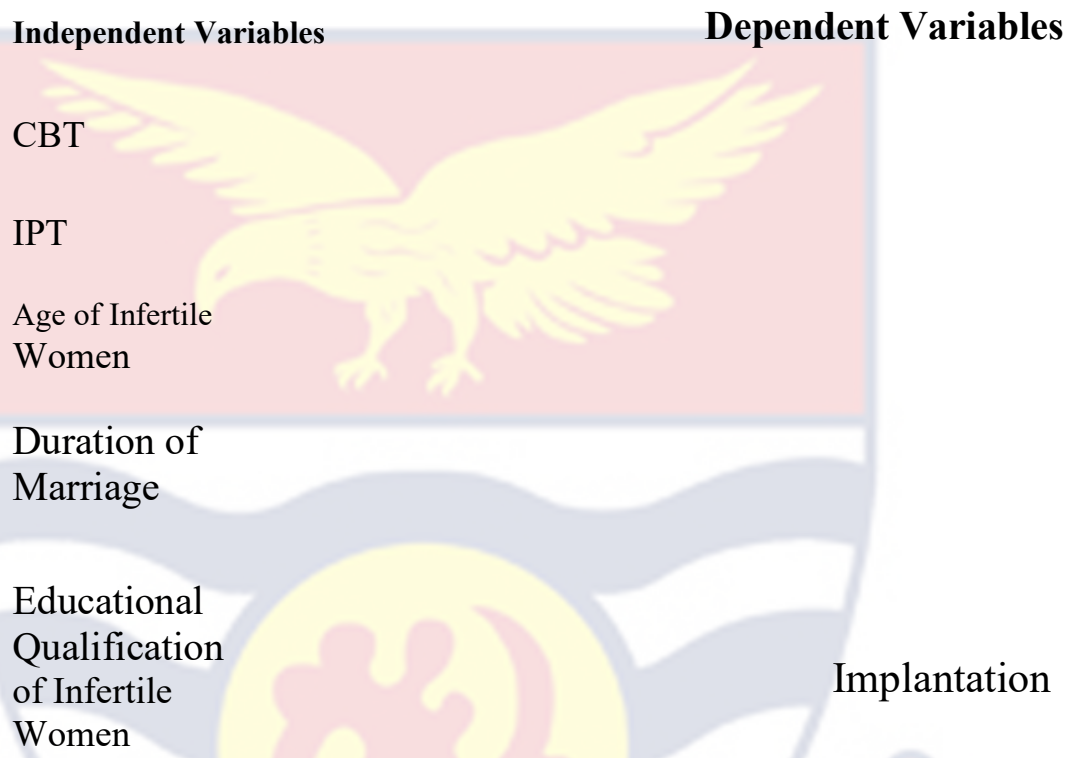

Figure 3: Conceptual Framework
Source: Author's construct

The research sought to determine whether CBT and IPT are effective in the reduction of infertility-related depression. It analysed whether the treatments were going to affect infertile women's depression levels and if an effect arising out of the therapies would result to an exponential growth in implantation levels. The research was also aimed to establish the effect of demographic variables on pre-test depression and also at post-test. Further, the research investigated if the efficacy of

CBT and IPT in the treatment or reduction of depression linked to infertility varied among participants based on the aforementioned demographic parameters.

Empirical Review

The headings below were used to discuss experimental and non-experimental research works under this section:

1. Infertility and Counselling Needs
2. Infertility related depression and CBT/IPT.
3. Age and infertility in women.
4. Length of Marriage and infertility in women.
5. Educational Attainment and infertility in women.
6. Infertility and Assisted Reproductive Technology (ART)
7. Psychological Interventions for Women with Infertility and Implantation.

To help address objectives one and three, literature on infertility related depression and the effect CBT and IPT has on depression levels of infertile depressed women was reviewed after considering infertility and counselling needs.

Infertility and Counselling Needs.

To help infertile couples, counselling has been highly recommended. The particular difficulties faced by couples engaging in Assisted Reproductive Techniques (ARTs) were established by Terzioglu (2001) and the psychological therapy needs of couples were assessed. 30 couples each were chosen for the therapy and control groups. The findings portrayed that couples in the therapy Group had lower scores for depression than the control group ones. For couples in

the experimental group, pregnancy rates and life satisfaction scores were greater than for the pairs in the control group.

A research in Iran by Noorbala et al . (2008) was to determine the factors causing depression in persons with infertility. It was a cross-sectional analysis. Among the participants, one hundred and forty couples with a BDI Score of at least seventeen were randomised before or during infertility treatment to receive psychological treatment. To remove confounding variables, logistic regression was performed. The findings showed that in 48 percent of women and 23.8 percent of men, depression was initially detected. In the population mentally treated until they received infertility care, the Mean and the standard deviation Beck scores of 18.7 + /-9.7 declined to 10.7 + /-5.8 respectively (p<0.001).

By telling women that they have a "incompetent" cervix, "low-quality" or "old" eggs or "insufficient" mucus, health care professionals can contribute to the fear; these insulting explanations can lead women to blame themselves and feel embarrassed, guilty and depressed (Lelly, 2006). A research in the UK was undertaken by Kerr, Brown and Balen (1999) to describe the perspectives of couples who have undergone treatment for infertility. A questionnaire was sent to 2000 representatives of two of the main national support groups for infertility. There were a total of 980 completed and returned questionnaires. One in three said they did not completely grasp the medical essence of their own infertility or that of their partner. Respondents encountered a large spectrum of negative emotions. One in five said they had suicidal thoughts, one in three said their relationship was strained by infertility, and just over a quarter discovered that their relationship

changed as a result of the procedure. A majority of 71 percent said that if it was given free of charge, they would request therapy, but only 12 percent were provided counselling free of charge.

The effect of six therapy sessions on emotional symptoms was measured by Bresnick and Taymor (1979). Along with the investigation and treatment of infertility, sixty-two couples received infertility therapy. To assess the frequency of psychological symptoms associated with their infertility and their reaction to therapy, a questionnaire was sent to all patients. In self-selected patients, the study reported the existence of a high incidence of emotional symptoms. It revealed that it also affects male partners, but less so. Research has shown that infertility therapy in several patients who have been the victims of their infertility crises helps boost life quality. It was also noted that fewer than 30 percent of the 212 couples offering therapy approved the referral. While there is a probability that many couples adapt easily and thus do not feel the need for professional assistance, the authors give no reason for the poor response. It is also likely that for others, therapy itself may be threatening. Without a control group, however, makes it laborious to determine the efficacy of the therapy given by Bresnick and Taymor (1979).

Wischmann, Stammer, Scherg, Gerhard, and Verres (2001) tried to design a system for couple's therapy for therapeutic intervention. The ultimate goal was to minimise facilities stress with a more reasonable approach to medical care decision–making and to increase overall chances of success with improving the consistency of the knowledge provided to infertile couples. The authors found that a more comprehensive method of therapy was actually necessary for about 20

percent of couples. For most couples with their desire to have a child not met, the standard offering of 2 therapy sessions was satisfactory. The authors noted that the therapeutic intervention for infertile women clearly requires systematic and thorough consideration and that the feasibility of the therapeutic modality need to be addressed.

The following studies have identified infertile women experiencing either primary infertility and/or secondary infertility: primary infertility (Emery et al., 2001; Galletly, Clark, Tomlinson, & Blaney, 1996a; Takefman, Brender, Boivin, & Tulandi, 1990; Tuschen-Caffier et al., 1999) & secondary infertility (Connolly et al., 1993; Domaretal., 1999; McNaughton-Cassilletal., 1999). A marital relationship's average length was eight years (Emery et al., 2001). Domar et al., (1999) recorded that 132 female participants completed an average of 17.1 (*SD*= 2.0) years of education, suggesting a higher level of career qualification. Interventions used either focal, cognitive behavioural or psychoanalytic approaches to inform infertile women and couples (Sarrel & DeCherney, 1985; Emery et al., 2001). Supportive sex therapy was given by Tuschen-Caffier et al., (1999). Psychoanalytic community counselling was carried out by Christie and Morgan (2000). Clark et al., (Clark et al., 1995; 1998), performed two Experiments on a related sample using cognitive behavioural group psychotherapy.

De Liz and Strauss' (2005) indicate that psychotherapy decreases depression for infertile women and likely increases the success of pregnancy. Psychological interventions that included educational interventions, counselling, CBT, psychodynamic/analytic interventions relaxation, enhance pregnancy rate and

mental health among primary infertile women were examined in another meta-analytical study by Hammer (2009). Ten recorded infertile women receiving ART (IVF or ICSI) for infertility, while eight examined infertile women receiving other medical treatments such as IUI for infertility were studied. Lastly, 3 of the studies documented mixed treatments in infertile women.

The following psychosocial findings (number of studies listed in parentheses) have been reported: depression (twelve), anxiety (twelve), mental distress (eight), interpersonal functioning (five) and stress by infertility (five). In 14 of the studies pregnancy rates were registered. After the therapeutic intervention, most of the studies assessed effects between four weeks and six months. The various intervention methods used were counselling (Emery et al., 2003; Emery et al., 2006; McNaughton-Cassill, Arthur, Bostwick, Robinson, & Neal, 2002; Wischmann et al., 2001), psycho-education (Lee, 2003; Shu, 2003; Chan, Ng, Chan, & Chan, 2006), cognitive behavioural interventions (Domar et al., 2000; Tarabusi, Volpe, & Facchinetti, 2004). Relaxation based on mind/body (Rezabek, Vichova, Pavelkova, & Zivny, 2003; Levitas et al., 2006), Psychodynamic analytic (Sarrel & DeCherney, 1985) and mixed therapies (Schmidt, Tjrnhj-Thomsen, Boivin, & Nyboe Andersen, 2005).

The findings of the meta-analysis of infertile women's psychological interventions show some proof of the effectiveness of psychological interventions in achieving pregnancy and show that they can be effective in increasing the rate of pregnancy for couples (Hämmerli, Znoj, & Barth, 2009).

Boivin (2003) determined whether psychosocial interventions enhance rates of well-being and pregnancy, and identified the most successful forms of interventions. Of the 380 reports, 345 were omitted from the study for different reasons as listed below :

a. Two hundred and ninety (290) studies referred to intervention(s) in psychosocial issues but did not provide any assessment;
b. Forty-seven (47) studies identified a case study that could not be generalised;
c. Five (5) studies examined non-specific patient-centred treatment given as part of routine treatment;
d. Three (3) study findings could not be interpreted.

The studies constitute 6.6 percent of the 380 studies' possible pool. They were grouped and analysed in connection with the intervention type. 1) 15 studies listed strategies for therapy, 2) 6 research based on educational approaches, usually involving one or two educational tasks, and 3) 4 research were systematic programs for education, it was informative, but it tested the efficacy of more systematic and standardised psychosocial educational approaches.

Review of the findings in a study involving obese anovulatory women found that in mitigating negative effects, CBT approaches were more effective than altering interpersonal functioning. It was doubtful that pregnancy rates would be influenced by cognitive behaviour therapies (Clark, Thorley, Tomlinson, Galletley & Norman, 1998). Group approaches that emphasised skills training and education were also found to be substantially more successful in achieving meaningful

progress than therapy interventions that emphasised emotional communication and encouragement and/or debate about infertility-related feelings and thoughts. It was found that women and men benefited equally from CBT, IPT and other therapy treatments. There is strong clinical evidence that infertile women seeking assisted reproductive treatment (ART) have high levels of anxiety, depressive symptoms, distress, and irrational beliefs. Studies show that infertile women need increased psychological support and are in need of it. Even though different findings suggest the effectiveness of infertile women's psychological therapies, pregnancy rates, I am of the view that additional studies of high-quality nature are also required in future research to obtain more conclusive answers on the effectiveness and indication of psychological treatments for infertile women.

Infertility Related Depression and CBT/IPT

Infertility as a disease is undeniably a big life crisis and mentally traumatic for several couples. The literature, however, indicates that infertility is more stressful for women than for men, and most surgical procedures performed on women that cause depression on the other hand (Farzadi, 2007). However, when a couple's infertility issues are due to sperm abnormalities, the level of stress of the man may be equivalent to the woman's. Women, regardless of which partner is at fault, appear to experience tension (Levy, Brizendine & Nachtigal, 2006).

Domaretal (1992) recorded in their study that 37 percent of infertile women had depressive symptoms. Manning (1977) claimed that presenting data about different diagnostic procedures was one of the most beneficial aids for couples undertaking an infertility medical investigation. She discovered that this made it

possible for couples to become professionals in their field of special concern, giving them a stronger sense of control and reducing stress, depression and anxiety.

The Centre for Epidemiological Studies Depression Scale (CES) was used by Nelson, Shindel, Naughton, Ohebshalom and Mulhall (2008) for depression and established that 19 percent of infertile women had mild depression and 13 percent had extreme depression. A research was conducted by Ehsanpour, Mohsenzadeh, Kazemi and Yazdeni (2007) which involved seventy-five couples (one hundred and fifty subjects) referred to Isfahan clinics for specialist infertility care. Data taken included personal and social attributes, stress, treatment of infertility and social support. The findings found that the mean stress-related infertility care score was 58.68 and 86.7 percent of couples encountered average to extreme stress in clinical infertility treatments. The highest and lowest social support score was 23.28 for spousal support and 84.45 for relatives at the 2nd and 3rd tier. There was an inverse association between stress linked to social support and infertility care (p=.0001). There was also a significant relationship with infertility treatment stress between age, sex, and job.

A research in the Netherlands was conducted by Verhaak (2005). It was a prospective longitudinal study before, during and after successive fertility treatment cycles. The study's purpose was to define the emotional change. Self-report questionnaires on depression, anxiety and coping were completed by a total of one hundred and forty-eight IVF patients and seventy-one partners. The anxiety and depression assessment was replicated immediately after the final period of therapy and again six months later (follow-up). The results show that, after unsuccessful

treatment, women showed an increase in both depression and anxiety. Women showed no recovery within 6 months of ineffective therapy. 20 percent of women displayed subclinical forms of depression and anxiety during follow-up.

Farzadi (2007) claimed that it is a serious life crisis to obtain a diagnosis of infertility. Infertility results in a decline in the quality of life and a rise in sexual dysfunction and marital discord. Shakhar (2009) mentioned that their lost parenthood, lost dream, lost child and lost sense of control would always be grieved by couples. Each failed loop is viewed as a loss. A natural reaction to this loss is mourning. Sometimes, couples are left alone and even what they are going through is kept hidden. Others also fail to understand what this loss means to them and though they decide to share. They're going to do almost everything possible to have a kid. For long stretches, this can occur, changing doctors and undertaking multiple invasive treatments. They can feel that once they achieve this purpose, there will be no joy in life (Shakhar, 2009).

Drosdzol and Skrzypulec (2009) revealed that 35.4 percent of infertile women, compared to 19.47 percent of fertile ones, scored above the cut-off score for serious symptoms of depression. Araoye (2003) claimed that because of its high prevalence and especially because of its severe social consequences, infertility is of public health significance in Nigeria and many other developing nations. Marital disharmony induces infertility, which also leads to divorce. Infertility is mostly blamed on women, and men participate in polygamy in an effort to have children. Because of the treatment of infertility, the couple also undergo tension.

Thiering, Beaurepaire, Jones, Saunders and Tennant, (1993), discovered that 28.3 percent of infertile women experienced mild up to moderate depression, 7.2 percent had moderate to extreme depression, and 1.2 percent had extreme BDI-based depression. Oddens, Den Tonkelaar and Nieuwenhuyse (1999) recorded that there were depressive disorders in 24.9 percent of infertile women. In 33 percent of infertile mothers, there were depression disorders (Lok et al., 2002). The total number of infertile women with depressive disorder ranges from 24 to 36 percent.

A research to investigate the coping strategies adopted by six hundred and fifteen women seeking infertility care in southern Ghana was carried out by Donkor (2009). The results showed that the majority of women chose to keep their fertility problems to themselves. The associated stigma of infertility may be the cause. In addition, by drawing on their Christian religion, the majority of women coped. Others also coped with their husbands' assistance, their profession by way of gaining economic freedom, and some avoided circumstances that reminded them of their problem of infertility.

Desai (2009) said that infertility is obviously a devastating state that affects many aspects of life. Many couples are nervous, depressed, feel lonely, experience marital tension and socially withdraw. Infertility is not a situation that is life threatening. To have a family, to fulfil a dream, to be happy is a challenge. The procedure itself is emotionally exhausting and the suffering that the couples experience will increase. If we consider it a fight for happiness, great strides should be made, regardless of the outcomes of treatment, to any mental suffering as much

as possible. Couples should be taught ways of reducing their tension, enhancing their coping, strengthening their connection.

A research was conducted by Tarabusi, Volpe and Facchinetti (2004) to determine if cognitive behavioural group therapy could lead to a reduction in psychological distress in couples awaiting assisted reproduction. The overall sample amounted to 50 couples. Two psychometric assessments were administered at baseline and after 4 months (Symptom Rating Measure and Westbrook Coping Scales). The females displayed a higher SRT level at the baseline than the males. Feelings of inadequacy, somatisation and anxiety, became visible. A trend towards a substantial decrease in the total value of Psychological Distress (SRT) from 17.7 to 14.1, (p=.07) was observed in females in the CBT sample.

Mcnaughton (2002) performed a study on the effectiveness of short pair support groups formed to handle the tension of IVF treatment using CBT strategies. Before and after group attendance, emotional and cognitive variables were measured using the Life Orientation Questionnaire, which tests optimism and pessimism; Beck Depression Inventory; the Scale of Social Provisions, which measures social help; the Beck Anxiety Inventory; and the Personal Views Survey, which measures irrational beliefs. The findings showed that after IVF therapy, women who attended group sessions were substantially less nervous than they were before the cycle (p<.001). Despite the fact that the service was comparatively cheap compared to IVF in the civilian population, it was difficult to shape and sustain such groups due to the difficulty of IVF care and the logistical and psychological stress faced by couples. Nevertheless, both women and men received psychological

benefits from the party: on completion of the group sessions, women registered less anxiety and men displayed greater optimism.

In South Africa, Zyl (2005) conducted a study to assess if patients receiving support therapy would be better prepared with successful coping strategies than patients who were not given counselling. Either the help therapy or the control groups were randomly allocated to sixty patients. Emotional support and therapy was provided to the support therapy group, and no counselling was provided to the control group. The findings showed that t-tests revealed a modified pattern of conduct within the support therapy community, which after the counselling intervention had a statistically significant (p<.017) reduction in anxiety levels.

Research by Domar et al. (1990) found that the 54 infertile women who completed the program of CBT along with relaxation response showed statistically significant reductions in anxiety, depression, and exhaustion as well as increases in vigor. Furthermore, within 6 months of completing the CBT, 34 percent of these women became pregnant. In the long-term treatment of infertility, these results identified a need for stress reduction.

A research was conducted in Italy by Facchinetti (2004) to determine whether the cognitive-behavioural treatment program diminishes the autonomic and neuroendocrine response to a demanding task in infertile women waiting for IVF-ET. The overall sample amounted to 45 couples. The Stroop Colour-Word (CW) was granted to women. Serially tested were systolic BP, Plasma cortisol and heart rate (HR). To receive CBT, subjects displaying a positive HR reaction were chosen (12 group sessions spanning 16 weeks). CBT substantially decreased the

HR response to Stroop CW while it remained unaltered in the observation community. Similarly, after CBT, Systolic BP response was minimised while there was an increase in the observation community. A substantial reduction in the reaction of plasma cortisol to Stroop CW occurred after CBT, while no modifications were seen in the other subjects.

Stotland (2002) found that infertility, reproductive technology, and abortion in most patients' lives are among the most emotionally weighty and philosophically divisive encounters. They include the sections and actions of the most intimate body and the most heartfelt expectations and profound disappointments. With partners, relatives and friends, they can strain relationships.

In New York, USA, Nelson (2008) performed a research to determine the quality of life, sexual wellbeing, and depression of infertile couples' female partners. Survey design was the design used. For the research, couples with infertility attending two medical tertiary care centres were chosen. The sample population consisted of 121 couples overall. Demographic fertility and data on co-morbidity have also been reported. 19 percent of women had mild depression, according to the depression scale, and 13 percent had extreme depression. With 26 percent of women scoring below 26.55, the mean total Female Sexual Function Index score was twenty-eight (maximum score of 36), a defined cut-off for the high risk of female sexual dysfunction. Depression and sexual dysfunction were common in female partners of infertile couples, the findings showed.

Wischmann (2004) found out that, while infertile couples seldom appear symptomatic from a psychological point of view, some of them require

psychological therapy. In the course of psychosomatic research on fertility disorders in Germany, comprehensive therapeutic concepts have been established over the last few years. Counselling techniques, patient advisory literature and the Infertility Advisory Network Germany are discussed. In the case of infertility, hints were given to perform therapy and curative care.

In the Netherlands, Lechner, Bolmer and Dalen (2007) conducted a study to determine the connection between the coping style and the degree of satisfaction of primary support groups with distress symptoms of involuntarily childless individuals with social support. The analysis was a cross-sectional one. The study consisted of 116 people. The findings showed that more health complaints, anxiety and symptoms of depression were faced by women. The study clarified that the variance of the various symptoms of distress ranged from 30 to 65 percent. Depression, anxiety and complex grief were negatively linked to the idea of active coping style.

In Ghana, West Africa, Fledderjohann (2012) investigated the effects for women with infertility. To gather data from 107 women seeking care at Gynaecological Clinics, he conducted a semi-structured interview. The research focused on mental wellbeing, marital dysfunction, social interaction and gender interactions on the basis of iterative open coding of the interviews. The findings showed that extreme social stigma, marital pressure and a number of mental health problems were faced by infertile women. Many women conclude that they bear an unreasonable share of the responsibility for infertility and, by default, face greater social repercussions for conceiving difficulties than male partners.

In Greece, Salakos, Roupa, Sotiropoulou and Grigoriou (2004) examined the psychological needs of women receiving IVF treatment and to stress the importance of the psychosocial help they may obtain from family planning centres. This was a closed-question cohort sample. The findings have shown that there is inadequate psychosocial support and the scientific evidence provided to these women. Fifty nine percent of women were seeking more medical data and 32.5 percent were seeking emotional support.

Covington (2009) observed that reproduction, driven by strong biological and psychological forces, is considered to be the most essential of human needs. The life-long epidemic of infertility begins with an epidemic when the desire to replicate is thwarted. It is regarded as an emotionally difficult experience that affects all facets of a couple's or an individual's life: relationships with others, life goals, social roles, self-image, self-confidence, and, to name a few, sexuality. There are many losses associated with infertility, including the loss of aspirations, ambitions, future plans, marital happiness, self-esteem, sense of control, confidence in life's justice, health and well-being, and most importantly, the child of the dream. In addition, these losses elicit feelings of shock, disbelief, sadness, rage, shame, blame, and depression that occur as patients pass through medical diagnosis and care in a repetitive and predictable phase. Infertility is an experience thatis physically draining and mentally demanding.

A study was carried out in Iran by Faramarzi, Kheirkhah, Esmaelzadeh, Alipour, Hjiahmad and Rahnama (2008) on psychological intervention for depressed infertile women. It was a clinical trial controlled by randomisation. A

total of 89 depressed women with infertility were split into three classes. 1 CBT, 2 antidepressant therapy group, and 3 control group. Ten sessions on relaxation preparation, restructuring and removing negative unconscious thoughts and unhealthy attitudes towards infertility were given to twenty-nine participants in the CBT group. Thirty Pharmacotherapy community participants received 20 mg of Fluoxetine daily for ninety days. There was no interference obtained by thirty control subjects. At the beginning and end of the study, all of the participants completed the General Health Questionnaire (GHQ) and the Beck Depression Inventory (BDI). The findings showed that Fluoxetine substantially decreased the mean of all four GHQ subscales, distress, depression, social function and psychosomatic signs. The overall GHQ scores were also substantially decreased by both methods. In 3 groups, fluoxetine group 50 percent, CBT 79.3 percent and Control 10 percent were effective treatment of depression. While the mean BDI scores in both Fluoxetine and CBT decreased significantly more than in the control group, the decrease in the CBT group was significantly greater than in the fluoxetine group.

In a Nigerian teaching hospital, Fatoye (2009) studied to classify the psychological state of infertile women's spouses. Compared with 95 matched monitors, 95 men who went with their wives to the fertility clinic were compared using the Hospital Anxiety and Depression Scale (HADS). Their rates were higher than the equivalent rates of 13.7 percent and 9.5 percent for the controls for severe anxiety symptoms (24.2%) and depressive symptoms (20.0 percent). The higher

incidence of severe depressive symptoms was significant (p<.05) in the infertility community.

To examine the psychological aspects of infertility, Dhaliwal (2004) conducted a study in Chandigarh, India. It was a prospective study. 120 couples with infertility is the complete study. The study consisted of 30 pairs of unexplained infertility, 30 of anovulation, 30 with tubal component, and 30 with male component. During the infertility work up, psychological tests were conducted at the initial time and at 3,6,9 and 12 months. The results showed that psychological components, especially in the male partner, have been found to play a significant role in infertility of unknown etiology. They influenced the male partner's personality and social behaviour and induced anxiety, but allowed the female partner to suffer from depression. The partner was concerned about the other's reaction in cases of organically induced infertility. In the partner with the fertility problem, anxiety was substantially higher than in the other partner.

A research in Kuwait was carried out by Fido (2004) to analyse the psychological state of women with infertility. The total sample was 120 infertile women. The instrument used was the Scale of Hospital Anxiety and Depression (HADS). Compared to an age-matched study with Pregnant Control. In all HADS parameters, infertile women showed substantially higher psychopathology in the form of stress, aggression, anxiety, suicidal ideation, self-blame and depression.

In the United Kingdom, Marcus (2007) conducted a survey of two hundred and forty-four infertility patients to evaluate the proportion of patients who then received counselling, how beneficial they found it, and to identify the key reasons

why patients might choose not to receive counselling. Seventy-three percent of all couples were given therapy that was either very helpful or helpful to over half the number of those patients. 37 percent felt they could deal on their own with patients who did not receive therapy, 21 percent protested that they were not given therapy, and 15 percent said they believed it would not be helpful.

In Iran, Nilforooshan, Ahmadi, Abedi, Mohammad Reza and Mahdi (2006) conducted a study to determine the impact of CBT on the depression of infertile couples based on the interacting approach of cognitive subsystems. The study model used was a quasi-experimental one. The sample consists of 30 infertile couples, who have been randomly placed in the control and experimental community. The inventory of Beck Depression tested all classes in two steps, pre-test and post-test. Pre-test and post-test had a time difference of 6 weeks. In 6 sessions, the study community was subjected to therapy based on the method of interacting cognitive subsystems. In session I, the subjects became acquainted with goals, infertility concept, generation of depression and its symptoms, and the relationship between depression and infertility. Furthermore, relaxation was carried out along with mental imagery. The topics were allocated to the identification of thoughts and emotions in session II. The III session also concentrated on emotions, mindfulness and meditation. Concentration on respiration was practiced in the IV session. In order to create the control schema, the V session was allocated. The emphasis was largely on how they could take care of themselves. They were told at the sixth session to deal with their mood status using their instructions in the future. The results showed that therapy based on interacting cognitive subsystems

is effective in reducing depression in the study group of infertile couples relative to the control group ($p<.0001$) and has a substantially higher impact on women than men.

Since the initial trials that gave hope to the treatment of depression, there have been several studies showing the positive effect of IPT treatment for depressed people (Blanco et al., 2001; Klerman, 1988; Dowrick et al., 2000; Klein & Ross, 1993; Shea et al., 1992; Reay et al., 2003; Ward et al., 2000). One of its authors, Myrna Weissman, a psychiatric epidemiologist at Columbia University, has meticulously researched the use of IPT in adult depression. She and other researchers were able to show that IPT was successful in reducing depressive symptoms both before and after the course of treatment (Dowrick et al., 2000; Hollon et al., 2002; Frank, 1991). IPT has also been shown to be effective when used in combination with pharmacotherapy (Frank et al., 1990). IPT is appropriate for a number of conditions and mental and physical health environments, including perinatal depression, eating disorders, teenage depression, somatisation, drug misuse, and bipolar disorder, in addition to depression.

Klier et al. 2001 evaluated postpartum depression in women in an open-trial pilot of group-format IPT in Vienna, Austria. They concluded that the majority of women who completed the therapy experienced a substantial reduction in depressive symptoms, implying that a group IPT approach to treating postpartum depression may be effective.

Lespérance et al., 2007 used a factorial design in a randomised controlled trial to assess a 12-week effectiveness of both a pharmacologic and a psychotherapeutic treatment in patients with coronary artery disease (CAD) who were undergoing a major depressive episode. The aim of the study was to see how effective citalopram (an antidepressant) and IPT is at reducing depressive symptoms in patients with CAD and major depression in the short term. Participants were randomly assigned to one of two groups: (1) 12 weekly sessions of IPT plus clinical management (n = 142) or clinical management only (n = 142), and (2) 12 weeks of citalopram (20 to 40 mg/d) or matching placebo (n = 142). Two instruments including BDI-II were used. The study found no evidence that IPT was superior to clinical management. As a result, while both IPT and clinical management increased stress levels in patients, there was no indication that IPT was superior. Also, the findings of the National Institute of Mental Health Treatment of Depression Collaborative Research Program, indicate that in patients with high baseline social disorder, IPT was not superior to clinical management (Sotsky et al., 1991).

Mulcahy et al., (2010) organised a randomised controlled trial that compared the results of an 8-week IPT group (IPT-G) for postnatal depression to ‘treatment as usual' (TAU) in a group setting in Australia. Women who were eligible were recruited and assigned to IPT-G or TAU. Comparisons revealed that both the TAU and IPT-G greatly improved by the end of treatment. However, in terms of mean depression scores, women in the IPT-G improved slightly more and continued to improve three months after treatment. These findings highlight the

potential benefits of an interpersonally based approach, which, when compared to standard care, improves outcomes for not only the mother but also the spouse and the child.

In an open study, Neugebauer et al., (2006) looked into whether miscarrying women who received one to six weekly sessions of manualised, telephone-administered interpersonal counselling (IPC), a variant of IPT, experienced significant reductions in depressive symptoms. IPC appears to reduce depressive symptoms after miscarriage, according to the results of this limited open study.

A randomised controlled study comparing group IPT to standard care in rural Ugandans who meet the symptom and functional disability requirements for the diagnostic and statistical manual of mental disorders (DSM–IV), major depressive disorder or sub-threshold disorder was done by Bass et al., (2006). The primary outcomes of a follow-up sample of trial participants were depressive symptoms, depression diagnosis and functional disability. At 6 months, IPT-G, participants had mean depression symptom and functional disability ratings that were 14.0 points and 5.0 points lower than the control group, respectively. Similarly, the treatment arm's incidence of major depression (11.7 percent) was substantially lower than the control arm's (54.9 percent; $p<.0001$).

O'Hara et al., (2000) determined the effectiveness of psychotherapy for postpartum depression. Women receiving IPT saw their Hamilton Rating Scale for Depression (HRSD) scores drop from 19.4 to 8.3, a substantial decrease compared to the WLC community (19.8 to 16.8). Over the course of 12 weeks, the BDI scores of women who earned IPT decreased from 23.6 to 10.6, a substantial decrease

compared to the WLC sample (23.0 to 19.2). In comparison to women in the WLC sample, a substantially higher proportion of women who earned IPT recovered from their depressive episode based on HRSD scores of 6 or lower (37.5%) and BDI scores of 9 or lower (43.8%) (13.7 percent and 13.7 percent, respectively). In comparison to women in the WLC sample, women who received IPT showed substantial improvement on the Postpartum Adjustment Questionnaire and the Social Adjustment Scale–Self-Report. Based on these data, IPT looks to be an effective treatment for postpartum depression. IPT improved social adjustment and reduced depression symptoms, making it a viable option to medication, especially for mothers who are breastfeeding.

In a 16-week bilingual randomised clinical trial by Margaret et al., (2003), a group of women receiving IPT for antepartum depression was compared to a control group of women receiving parenting education. Fifty outpatient antepartum women with major depressive disorder who met DSM-IV requirements were randomised to either IPT or a didactic parental education program. Thirty-eight women were held in the study and their data was analysed. Depressed mood was assessed using the Hamilton Depression Rating Scale, Edinburgh Postnatal Depression Scale and BDI. On all three mood tests at the end of the study, the IPT treatment group outperformed the parenting education control group. IPT is an important form of antidepressant care during pregnancy, according to the researchers, and should be the first-line treatment in the hierarchy of antepartum depression treatment.

According to Verdeli et al. (2003), it is still unclear which elements of IPT's framework will be relevant in non-Western and developing countries. The structure includes the medical model, the interpersonal background of depression, and the four types of interpersonal crises correlated with the occurrence of depressive episodes, referred to as the four 'problem areas' - interpersonal deficits, grief, role transitions and interpersonal disputes. The rationale and process of adapting group IPT (IPT-G) for a randomised clinical trial with depressed people in Uganda, a developing East African country was, therefore, studied by them. With considerable skepticism around three topics, they embarked on the project of adapting IPT for depressed people in Ugandan communities: Will the locals be open to the idea of a depression intervention? Will the research team be able to teach IPT-G to people who aren't in the mental health field? Will the majority of IPT's basic assumptions, which were built in the United States, apply to Ugandan communities? The results indicated that the depressive effects of these universal factors, as well as the effectiveness of IPT, extend beyond the boundaries of Western culture.

Koszycki et. al., (2012) looked at the effectiveness and preliminary efficacy of IPT, the evidence-based antidepressant technique with the most peripartum research support, as a treatment for depressed women who were having fertility issues for the first time. Patients with at least moderate severity major depressive disorder were randomly assigned to either 12 sessions of IPT (n = 15) or brief supportive psychotherapy (BSP: n = 16) which was their control intervention. Both groups of patients improved. IPT had a higher response rate than BSP, with over

two-thirds of women experiencing a >50% decrease in Montgomery–Sberg Depression Rating Scale ratings (MADRS). IPT also had lower posttreatment scores on the BDI, anxiety subscale of the Hamilton Depression Rating Scale and Clinical Global Impression-Severity Scale. Gains were maintained after a six-month follow-up. The pilot study indicates that IPT is a promising therapy for depression in infertility, and that it may outperform a strict active control condition.

In conclusion, CBT based on the method of interacting cognitive subsystems and IPT are beneficial in minimising depression in infertile women, and it would be best to include them as part of therapy along with infertility-related biological therapies. Though individually, both CBT and IPT have proven to be effective in reducing depression among infertile women, it was not so clear from the literature reviewed as to which of them is more effective than the other. Therefore, the researcher is of the view that further studies need to be conducted to find out which one is more effective.

The next lines of literature review looked at Age and Infertility in Women, Length of Marriage and Infertility in Women as well as Educational Attainment and Infertility in Women to help address objectives two and four.

Age and Infertility in Women

The anxiety and depression in infertile women is greater by growing age and getting diploma training or less (Lion, 2002). The mean depression score stratified by the age of the respondents was seen in Ghana in a study by Alhassan et al. (2014). Depression was found to be more prevalent in women over the age of 26 years and to be extremely important in women over the age of 35 years (p<.001).

Until the age of 40 years, the mean depression score was higher at a higher age and remained stable afterwards. A strong positive association between the subject's age and the depression BDI score was observed.

In Ogbomoso, Southwest Nigeria, the study of Oladeji and OlaOlorun (2017) found a depression prevalence of 52.7 percent among infertile women. However, the age group of respondents, their degree of education, years after marriage and form of infertility were not significantly related to depression in the infertile women. Depression was significantly associated with deficiency in the respondents' social functioning.

In their study, Mohammad and Ghodrati (2018) found that the rate of depression decreased with age in females. In fact, there was an inverse relationship between the age of the females studied and their prevalence and severity of depression. Benbella et. (2018) In their research study in Morocco, found out that 55% of women had depression and 45.6% had moderate to serious anxiety. In contrast to unemployed women, depression and anxiety scores were poor in working women. There was no important association between anxiety and depression and the age or form of infertility of females. Anxiety was correlated significantly with the period of infertility, the cause of infertility and the degree of education (p=.006), whereas depression was not correlated significantly with these variables.

Length of Marriage and Infertility in Women

Depression increases with infertility period (Domar, Seibel & Benson, 1990), and with the lengthening of infertility time, there has been a pattern of

growing psychological stress. The study by Kee, Jung and Lee (2000) showed that the level of depression in infertile patients undergoing treatment varies according to the duration of treatment for infertility. The research reveals that the effects would be shorter with longer treatment periods than those undergoing treatment for the first time.

Other research has revealed that psychological distress rises with time in infertile women (Berg & Wilson, 1991) and depression peaks between the second and third years of infertility and does not return to the normal range until after an infertility period of six years (Domar, Friedman, Broome, Seibel & Zuttermeister, 1992). A study by Khademi et al, (2008) suggested a positive correlation between duration of infertility and scores of depression.

Shakhar (2009) believed that the longer infertility lasts, the more disastrous its effect would be. Shakhar (2009) suggested that, depending on the social support structure they have, on their personalities, on the strength of their marital relationship, and on how tolerant their environment, how badly infertility will affect the couple's life. Nevertheless, the longer infertility lasts, the more catastrophic its effects would be.

In a study by Khademi et al. (2008), a positive association between the length of infertility and depression scores was shown. The study indicates that if the woman is positive about the effects of medical intervention and receives help from doctors and relatives for a higher pregnancy rate in the future, and if social and family pressures are absent and there is a deep understanding of infertility, mental stress and depression will be much lower during the first year of infertility.

The infertility would eventually change to a chronic problem with a long period of infertility and repeated reference to the doctors.

A research was conducted in Sweden by Wirtberg, Miller, Hogstrhm, Tronstad and Lalos (2007) to explore the long-term experience of childlessness among 14 Swedish women, 20 years after their treatment for infertility. In-depth interviews were carried out. The implications were encountered at the personal level as well as at the interpersonal and social level. Half the number of women is segregated from each other. In detrimental and long-lasting ways, one sexual life was impacted. At the time of the research, as the women's peer group reached the grandparent stage, the effects of childlessness were particularly enhanced. By caring for others, such as the children of friends or family, elderly parents or animals, many coped with their childlessness.

Educational Attainment and Infertility in Women

Parveen (2008) carried out a study to examine Pakistan's Psychosocial adjustment of Uneducated and Educated Infertile Females. The criterion was that they had a minimum marriage period of 3 years without children and were under care. Forty translated items were used in this analysis to test the psychosocial changes obtained from the Bell Change Inventory (BAI). The knowledge was analysed using SPSS. The results showed a substantial difference between educated and uneducated infertile women's psychosocial adjustment. The influences of social status, work and unemployment also have a major effect on the adaptation of infertile women.

The final sets of literature review the researcher made were on Psychological Interventions for Women with Infertility and Implantation after reviewing literature on Infertility and Assisted Reproductive Technology to help understand fertility treatments which include In Vitro Fertilisation (IVF) and how implantation occurs. All these helped to address objectives five, six and seven.

Infertility and Assisted Reproductive Technology (ART)

The treatment of infertility, including some physical treatments, is often complicated, time-consuming and costly, but mental stressors are more critical for couples and their effects on the quality of life (Farzadi, 2007). Infertility medical care typically requires the use of fertility medicine, surgery, or a combination that improves fertility. The following are the ART treatment methods used to address infertility situations:

In Vitro Fertilisation (IVF)

IVF is a major infertility procedure. The procedure includes tracking the ovulatory process of a woman, extracting eggs from the ovaries of the woman and enabling them to be fertilised by sperm in a laboratory using some reagents. It is known as natural cycle IVF when the natural cycle of a woman is tracked to gather a naturally selected ovum (egg) for fertilisation. With the goal of ensuring a healthy pregnancy, the fertilised egg (zygote) is then transferred to the uterus of the patient. In 1978, the first successful birth of a "test tube infant," Louise Brown, took place (Silver, 2000). Since her birth, more than 8 million people have been born through IVF worldwide.

In Norway, Sundby (2007) studied to know the impact of in-vitro fertilisation on women less than 10 years after treatment. Using a questionnaire, the data collection was completed. He concluded that with the aid of assisted reproductive technology, between 2.1 percent and 4.2 percent of all children born in Scandinavian nations were conceived. Although infertility itself is recognised as a life crisis, a number of emotional responses are triggered. Treatment for infertility is costly and is not necessarily covered by insurance. The American Reproductive Medicine Society estimates that the cost of an IVF cycle is US$12,400.00 (GHS88,146.64 at a rate of GHS7.1086 to US$1.00 as of 21st April 2022) on average, and success rates are < 50 percent. In Ghana, the average cost of IVF is US$5,000.00 (GHS35,543.00)

In India, in 2 major cities, New Delhi and Mumbai, Widge (2005) conducted a study. The overall sample amounted to 22 couples. Independent interviews with the participants showed that the welfare of women have been affected, and stigmatisation and isolation have been experienced. They saw the process of IVF as a physiologically, emotionally and financially exhausting process. He concluded that femininity and motherhood are characterised by fertility in Indian culture, stigma abounds and women are pressured for a biological child.

Couples can take second jobs, obtain loans, deplete savings, or accumulate debt to continue treatment. Even with exemplary effort, many couples cannot afford to initiate or continue advanced treatments for infertility. Those associated with religions that limit assisted-reproductive technology may feel pressured to choose between their dreams of becoming parents and doctrinal dictates (Lelly, 2006).

Intra-Cytoplasmic Sperm Injection (ICSI)

ICSI is an IVF technique in which a single sperm is directly injected into the egg. Most generally, this technique is used to solve problems of male infertility, although it can also be used where sperm cannot easily penetrate eggs (French, Sabanegh Jr, Goldfarb, & Desai, 2010).

Zygote Intra-Fallopian Transfer (ZIFT) is a treatment for infertility where a blockage in the fallopian tubes prevents sperm from binding to the egg normally. Egg cells are removed from the ovaries of a woman and fertilised in vitro. By way of laparoscopy, the resulting zygote is inserted into the fallopian tube.

Gamete Intra-Fallopian Transfer (GIFT) is a mechanism for infertility-assisted reproductive technology (Asch, Ellsworth, Balmaceda & Wong, 1984). Eggs are removed from the ovaries of a woman and inserted along with the sperm of the man in one of the Fallopian tubes, which enables fertilisation to take place within the uterus of the woman (Khalatbari, Ghorbanshirodi, Akhshabi, Hamzehpour, & Esmaeilpour, 2011). The GIFT technique is used less with the advances in IVF as IVF pregnancy rates seem to be equal or better and do not need laparoscopy when the egg is placed back (Rabizadeh, Nuri, & Taeibzadeh, 2002; Toner, 2002).

ICSI, IVF, ZIFT, GIFT and related techniques are together known as as assisted reproductive technology (ART). In this study, IVF will be used for the fertility treatment. ART techniques for assisted reproductive technology typically start by stimulating the ovaries to increase the development of eggs. In order to produce one or more embryos, the doctor surgically removes one or more eggs from

the ovary following stimulation and couples them with sperm in a lab setting. In a procedure known as embryo transfer, fertilization occurs outside of the body and the fertilized egg is then placed back into the woman's reproductive system. Tuboplasty, aided hatching, and genetic diagnosis for preimplantation are other medical techniques. Even though all the methods enumerated above have shown to be effective and have contributed in making a lot of infertile couples and individuals across the globe have children of their own, I believe the cost involved in these procedures have made accessibility an issue for a lot more childless couples and individuals. Governments particularly in developing countries including Ghana should put in place mechanisms to make the methods affordable for all.

Psychological Interventions for Women with Infertility and Implantation

The relationship between physical health and psychological influences has been recognised by philosophers and scientists for centuries. It has been shown that both cognitive variables (e.g. response expectations) and emotional variables (anxiety and depression as examples) lead to symptoms, physical sensations, and suffering (Kirsch, 1990; Trief, Grant, & Fredrickson, 2000).

The sense of uncertainty is compounded by a lack of comprehension and knowledge failure to predict the results of therapies for fertility. To overcome a sorrow like that considerable time and energy is needed for negative feelings (Kang & Kim, 2004; Han, 2003). These changes cause the vascular system to contract, reduce the circulation of blood to the tissue and impede ovum production and ovulation in the ovary. Fertilisation and implantation are therefore avoided and adverse pregnancy effects are induced (Domar et al., 2000). Recent studies have

shown that the psychological and emotional state of an infertile woman is essential in IVF outcomes; procedures, and mental-body dependent psychosocial treatments have beneficial impacts on pregnancy outcomes (Bae, Kim, Chang & Kang, 2011; Cousineau, 2004; Chan, Ng, Chan, Ho, & Chan, 2006; Domar, Clapp, Slawsby, Kessel, Orav, & Freizinger, 2000 b; Park, 2000; Hosaka, Izumi, Matsubayashi, Sugiyama & Makino, 2002).

Depression can affect the treatment of infertility and also affect the intensity and durability of the affected couple's relationship (Ashkani, Akbari, & Heydari, 2006). Research by Ramazanzadeh et al. (2009) shows that awareness of the likelihood of being left childless before treatment for depression and acceptance of the likelihood of being left childless are factors that decide the emotional reaction that occurs in response to failure to treat infertility.

In China, Lokih (2002) conducted a study to examine the psychological morbidity in Chinese infertile women receiving ART treatments and the effect of treatment failure as well. Prior to and three weeks after the ART procedure, the thirty-item General Health Questionnaire (GHQ) and the Beck Depression Inventory (BDI) were used. The sample number was 372. 33 percent of the participants ranked above the GHQ cut-off prior to treatment. 8 percent had a 20 or higher BDI score, suggesting mild to extreme depression. 43 percent scored above the GHQ cut off after failed treatment, and eight percent had BDI scores of 20 or above. The GHQ and BDI post-treatment scores were significantly higher at baseline than the corresponding scores (p<.001). Around 13 percent of the participants mentioned ideas around self-harm.

Once IVF treatment results in pregnancy and negative emotional responses begin to fade, it becomes more clear that stress triggered by therapy is significantly linked to fear of treatment failure (Hammarberg, Astburg & Baker, 2007; Verhaak et al., 2007). Levy, Brizendine and Nachtigal (2006) found that infertility is rarely embraced with equanimity by patients, and their reactions include shock, denial, frustration, loneliness, remorse, and grief. The prevalence among women undergoing infertility assessment of psychiatric major depression, low self-esteem, and sexual dysfunction does not vary significantly from that of their fertile peers. Even so, a roller coaster ride of emotions is recorded by infertile women; optimism as treatments are attempted, disappointment as treatments fail.

A research was performed by Terzioglu (2001) in Turkey to identify the efficacy of therapy on assisted reproductive techniques. This was an experimental study with thirty couples each for both experimental and control groups. The routine processes were encountered by couples in the control group and the couples in the experimental group took part in the therapy. The couples were given three psychological assessments, during the pre-test and post-test. These were checks for anxiety, depression, and satisfaction with life. The study results showed that couples had lower anxiety and depression scores in the experimental group than couples in the control group. For couples in the experimental group, life satisfaction scores and pregnancy rates were greater than for the pairs in the control group. This study demonstrates the significance of the nurse's counselling function and the advancement and implementation of counselling services in centres for ART, in

reducing the levels of couples' anxiety and depression, and in ensuring treatment progress.

Other studies indicate that psycho-cognitive therapy (behavioural, cognitive and psychotherapy) can lead to higher pregnancy rates during the diagnosis and treatment phase, especially before IVF therapy and pregnancy testing, and the use of psychological treatment can increase the risk of pregnancy even after following up for six months (Boivin, Griffiths & Venetis, 2011).

The goal of Abedinia, Ramezanzadeh and Noorbala (2009) was to determine the factors influencing infertile couples' depression and the impact of psychological intervention on infertile couples' pregnancy rates. Six hundred and thirty eight patients who were infertile were referred to a university. Thirty-five clinics for infertility were assessed. At least one of the partners was found among the 140 couples with various degrees of depression, and the study was continued by separating them randomly into two groups and joining a randomised clinical trial. The patients in the case group received 6-8 psychotherapy sessions prior to infertility treatment and received 20-60 mg of Fluoxetin daily at the same time, and no intervention was given to the control group. Both patients were asked three questionnaires, including a socio-demographic questionnaire, the Stress Scale (Holmes-Rahe) and the Beck Depression Inventory (BDI). Two groups compared the rate of pregnancy. Results: In 48 percent of women and 23.8 percent of men, depression was initially found. In the group psychologically treated prior to receiving infertility treatment (p<.001), the mean ± *SD* Beck scores dropped from 18.7±9.7 to 10.7±5.8. The pregnancy rate in the case group was 47.1 percent and

the control group was 7.1 percent. In both classes, the rate of pregnancy showed a significant association with the period and cause of infertility and the degree of stress (p<.001). In couples with a second level of male education, the pregnancy rate has been shown to be higher (p< .001).

Karlidere et al. (2008) examined whether infertile Turkish women's emotional distress is linked to social support and affects the outcome of their care with IVF and /or ICSI. The research included 104 Turkish women who were predominantly infertile prior to their embryo transfer date. Comparisons were made with those women who naturally became pregnant. The findings revealed that, despite equal levels of social care, non-pregnant women had a greater number of emotional symptoms compared to pregnant women. Low pregnancy rates were also predictive of the increased incidence of depressive symptoms and higher anxiety levels (Karlidere et al., 2008).

Gurhan, Atici, Akyuz and Kisa (2009) estimated the correlation of depression and anxiety scores during IVF treatment with oocyte and sperm numbers and pregnancy rates. The Spielberg Condition and Trait Anxiety and Beck Depression Inventories were administered to 80 Turkish couples. A strong association (r = -.25) between depression and oocyte pickup data for women and the number of oocytes was obtained. The study showed that with higher depression, low oocyte numbers were associated. For sperm counts with anxiety and depression scores on the day of oocyte and sperm selection, no important association was identified, but sperm motility was weakly and inversely associated with depression scores. Women with a high level of state anxiety had substantially lower pregnancy

rates on the oocyte pickup day, as did those with higher depression. The study proposed that health professionals should give counselling to couples on fertility-related issues in IVF units (Gurhan, Akyuz, Atici, & Kisa, 2009).

Clapp, Domar, Slawsby, Dusek, Kessel and Freizinger (2000), research was done in Boston to assess the effectiveness of 2 separate community psychological interventions on viable pregnancy rates in women with infertility lasting less than two years. Prospective, single-blind, controlled, randomised research was the design employed. The sample size was 184 women who had been trying for 1 to 2 years to get pregnant. The respondents were randomised into a cognitive behavioural group of 10 sessions, a regular support group, and a control group. For 1 year, they were followed. While there were dropouts, a total of 47 were eventually chosen for the cognitive behavioural group, 48 for the support group and 25 for the control group. Relaxation therapy (meditation, progressive muscle relaxation, imaging, autologous therapy and yoga), cognitive restructuring, emotional expression strategies, diet & exercise were obtained by participants in the cognitive behavioural community. The findings showed that, compared with 20 percent of the controls, 55 percent of the cognitive-behavioural and 54 percent of the support group participants experienced a viable pregnancy. For the patient without conception assured, the process of diagnosis and treatment of infertility is time consuming, economically and mentally burdensome, and physically difficult (Lee , Song, Kim, Moon & Kim, 1998; Cho & Park, 1996;).

Infertile women undergo serious emotional and relational changes after IVF failure and feel great loss and sorrow, losing hope for pregnancy (Worthington,

1995). An infertile woman experiences anxiety because of the complexities in both personal and relational aspects. If she fails the IVF procedure, the anxiety worsens (Verhaak, Kremer, Smeenk, van Minnen & Kraaimaat, 2005), which is known to be the last infertility option. When an IVF therapy progresses, anxiety increases (Kim, 1999; Bae et al., 2011).

The effect of a six-month CBT for infertile couples was assessed by Tuschen-Caffier, Florin, Krause and Pook (1999). In the therapy program, seventeen idiopathic infertile couples were included in the study. The goal of the intervention was to increase the likelihood of reproduction, sexual functioning and fulfilment. In addition, the goal of the research was to minimise helplessness and develop communication skills. The pre-post outcome showed that the treatment group showed an increase in sperm concentration, a decrease in helplessness and a decrease in marital distress. Participants practiced timed intercourse more consistently at the end of the procedure and registered unchanged sexual gratification and satisfaction during the menstrual cycle's non-fertile era. Problem-focused thoughts had reduced at the six-month follow-up. The live birth rate was higher than in control samples in the therapy community. The preliminary results indicate that CBT could be a successful solution to infertility care.

Faramarzi et al., (2008) compared the efficacy of CBT with medication (fluoxetine) in infertile women to treat depression and anxiety in three categories, namely the CBT, anti-depressant and control groups. 10 sessions of relaxation training and cognitive restructuring to control negative unconscious thinking and unhealthy behaviours were offered to twenty-nine participants in the CBT group.

In the anti-depressant (Fluoxetine 20 mg) group, 30 participants received 20 mg of fluoxetine daily for 90 days. There was no interference obtained by thirty control subjects. Results showed progress as follows: 50 percent anti-depressant group, 79.3 percent CBT group, and 10 percent control group. The decline was considerably greater in the CBT community than in the anti-depressant community. The study indicates that in reducing depression and anxiety in infertile women, CBT was not only a safe alternative to pharmacotherapy, but was also superior to fluoxetine in the management of depression.

The effectiveness of CBT and standard support approaches on pregnancy rates in women with infertility lasting less than two years was studied by Domar et al. (2000). The sample was one hundred and eighty-four women who had been trying for 1 to 2 years to become pregnant. Participants were randomised into a CBT group of 10 sessions, a regular support group, or a control group for routine treatment. For 1 year, they were followed. Data have shown that group psychological interventions in infertile women tend to contribute to increased pregnancy rates.

The effect of CBT on the depression of infertile couples was studied by Ramezanzadeh, Noorbala, Abedinia, Forooshani, and Naghizadeh (2011). Using the BDI, 30 infertile couples randomly placed into two groups (experimental and control) were evaluated. The time lapse was 6 weeks between pre-test and post-test. During six sessions, the experimental group was exposed to CBT. The study shows that in the experimental community, CBT is effective in reducing the depression of infertile couples relative to the control community ($p<.0001$) and has a significantly

higher impact on women than men (p=.009). For a better outcome of infertility therapy, the findings recommend following CBT along with biological therapies.

The study by Berga et al., (2003) evaluated whether CBT can restore ovarian function to problem attitudes common to infertile women with functional hypothalamic amenorrhea. Sixteen infertile women with functional hypothalamic amenorrhea, normal body weight, and no psychological disorders were recorded. Subjects were randomised for 20 weeks under CBT or observation. Results showed that of the eight CBT-treated infertile women, six had resumed ovulation, one had partial ovarian function recovery without evidence of ovulation, & one had no ovarian function restored. One resumed ovulation of those randomised for observation, one had partial restoration of ovarian function, and six did not recover. CBT thus resulted in a higher rate of ovarian activity (87.5 percent) than among infertile women with functional hypothalamic amenorrhea in the observation community (25.0 percent). All stasis was more likely to result in resumption of ovarian function than observation, intended to reduce unhealthy attitudes linked to hypothalamic.

The effect of cognitive-behaviour intervention on the pregnancy rate of infertile couples was assessed by Nilforooshan, Ahmadi, Abedi and Ahmad (2006). 140 pairs (280 patients) with depression (from moderate to severe) in at least one of the partners were chosen out of 638 infertile patients assessed. Informed consent was given by all couples and randomly numbered from 1 to 140. Prior to infertility care (experimental group), those with even numbers were allocated to the CBT and those with odd numbers were not allocated to the psychiatric intervention (control

group). Before starting infertility care, patients in the experimental community received individualised 6-8 sessions of CBT along with Fluoxetine (antidepressant) at 20-60 mg per day during the CBT era. Neither interference was received by the control group. Before and after treatment, three questionnaires, a socio-demographic questionnaire, the BDI and the Stress Scale (Holmes-Rahe), were issued to all patients. Sonographic detection of gestational sacs 6 weeks after the last menstrual cycle was used to equate the clinical pregnancy incidence between the two classes. The findings showed that pregnancy occurred in the experimental group in 33 (47.1 percent) couples and in the control group in just 5 (7.1 percent) couples. There was a substantial difference between the treatment and control groups in the pregnancy rate ($p<.001$). The findings (logistic regression analysis) showed that pregnancy in the experimental group was 14 times higher than that of the control group. During the IVF and embryo transfer (IVF-ET) program, higher cardiovascular susceptibility to stress is associated with a lower pregnancy risk.

In infertile women waiting for IVF-ET, Facchinetti, Tarabusi and Volpe (2004) assessed whether the CBT software attenuates the autonomic and neuroendocrine response to a stressful mission. Samples consist of forty-five pairs with a mean infertility period of 3.1 years. Two-thirds of them have missed an IVF-ET attempt already. The Stroop colour-word (CW) was administered to females until included on the waiting list. Serial tests were made for systolic BP, heart rate (HR) and plasma cortisol. Subjects exhibiting positive heart rate reactions were chosen to receive CBT (12 group sessions for 16 weeks) for the same time span (observation group), while the others only waited. Subjects were tested with Stroop

CW after 17-19 weeks. CBT substantially decreased the heart rate response to Stroop CW while it remained unchanged in the observation community. Similarly, after CBT, systolic BP response was decreased, while there was an increase in the observation community. A substantial reduction in the reaction of plasma cortisol to Stroop CW occurred after CBT, while no changes were observed in the other subjects. Findings suggest that CBT is useful in reducing the level of anxiety in IVF-ET care for infertile mothers.

Sinha (2002) researched the effectiveness of the cognitive behaviour intervention program in alleviating depression and anxiety symptoms in women with infertility and enhancing their well-being as an alternative to medical care. The Hospital Anxiety and Depression Scale (HADS), the infertility reaction scale (IRS) and the subject well-being inventory (SWBI) were taken and sequentially allocated to the experimental (N=5) and control (N =5) groups and administered to ten women diagnosed with infertility. The infertile women received both medical care and cognitive behaviour intervention in the experimental group, while only medical care was provided to the control group. The outcome review revealed that the score of both HADS and IRS in the experimental community had declined in significance. This showed that the intervention of cognitive behaviour along with routine medical care was successful in alleviating the symptoms of depression in women with infertility.

The goal of Abedinia, Ramezanzadeh and Noorbala (2009) was to determine the factors influencing depression and the aftermath of psychological intervention on infertile couples' pregnancy rates. 638 infertile patients referred to

35 infertility clinics at the university were measured. At least one of the partners was found among the 140 couples with various degrees of depression, and the study was continued by separating them randomly into two groups and joining a randomised clinical trial. The patients in the case group received 6 to 8 psychotherapy sessions prior to infertility treatment and received 20 to 60 mg of Fluoxetin daily at the same time, and no intervention was given to the control group. All patients were given three questionnaires, including a socio-demographic questionnaire, the BDI and the Stress Scale (Holmes-Rahe). Two groups compared the rate of pregnancy. Results: In 48 percent of women and 23.8 percent of men, depression was initially observed. In the population mentally treated prior to seeking infertility care (p<.001), the mean ± SD Beck scores decreased from 18.7±9.7 to 10.7±5.8. The pregnancy rate in the case group was 47.1 percent and the control group was 7.1 percent. In both classes, the rate of pregnancy showed a significant association with the period & cause of infertility and the degree of stress (p< .001). In couples with a second level of male education, the pregnancy rate has been shown to be higher (p<.001).

Starting one month before their IVF periods, Schmidt, Holstein, Christensen, and Boivin (2005) tracked 166 women, and the results showed no substantial association between psychological stress and the outcome of IVF. The study proposed to infertility clinics that it could be necessary during the treatment process to reduce the stress faced by IVF patients. While an IVF outcome may not be influenced by psychological stress encountered during a cycle; it is likely that IVF experience may result in stress that leads to depression. IVF's economic effects

can affect anxiety and become overwhelming. However, the experience of infertility itself may also cause intense stress and depression for many couples.

A research by Lund, Sejbaek, Christensen and Schmidt (2009) reveals that at 1-year follow-up, 14.8 percent of infertile women with unsuccessful treatment experienced significant depressive symptoms. This is analogous to a Dutch longitudinal cohort study showing that 20 percent of infertile women scored above the depression threshold calculated by the Beck Depression Inventory after a final ineffective treatment period (Verhaak, Smeenk, Van Minnen, Kremer, & Kraaima at, 2005). However, in this Dutch study, prevalence was not assessed prior to the start of fertility care.

Summary

Approximately 10-15 percent of couples experience infertility during childbearing era. Infertility is a traumatic occurrence that can give rise to emotional issues. For several couples, infertility is a severely distressing experience. Depression is known to be one of the major infertility-related psychiatric conditions and can greatly impact the life, care and follow-up of infertile individuals. Infertility-related stress was shown to increase depression, irrational beliefs, defensive mechanisms, marital disputes, reduced sexual satisfaction, sexual functioning, quality of life, self-efficacy, intimacy and wellbeing in the literature review.

Fertility therapies for women and their families are both emotional and a physical burden. Psychological variables such as changes in heart rate, depression and anxiety, triggered by stress are indicative of a decreased likelihood of achieving

a viable pregnancy. Infertility is, in reality, a dynamic life problem, a psychological threat and emotional pressure. It has reviewed interrelationships between outcome variables such as depression, cognitive distortions and infertility.

Previous studies have shown that depression, cognitive distortions, and infertility are positively related. In addition, studies have shown that CBT and IPT have been effective in reducing depression among infertile women. While several studies have investigated the effectiveness of CBT on depression among infertile women, little can be said about the effect of IPT on depression among infertile women. This can be explained by the fact that IPT is a relatively new therapy as compared to CBT. Also, the effect of infertility on the age, duration of marriage and educational qualification of infertile women was also looked at in this chapter.

The literature review, in short, examined the concepts underlying the study. CBT and IPT were studied under the theoretical analysis. The numerous experimental and non-experimental studies on depression and its related issues among infertile women conducted by different researchers in Ghana and abroad were also looked at in the final stages of this session. It became evident through the empirical studies that depression really exists among infertile women and that psychotherapies such as CBT, IPT and others could help reduce depression among infertile women and thereby promote higher implantation. It appears that CBT and IPT in particular have not attracted much attention of researchers in Ghana as therapies for treating depression in infertile women and the resultant effect they will have on implantation. Hence, my research interest.

CHAPTER THREE

RESEARCH METHODS

Introduction

The methods discussed in this chapter include philosophical foundation, research design, population, survey and sampling process, data collection process, data analysis and ethical considerations.

Philosophical Foundation

The researcher is inclined to the positivist paradigm in this research. The philosophy that underpins quantitative analysis is often referred to as "positivism" which is a term coined by Auguste Comte. As a way of comprehending human behaviour, he stressed observation and reasoning (Comte, 1856). His scientific method is adopted by positivist philosophers as a means of information production. Hence, it must be interpreted in the context of scientific assumptions and concepts.

The quest for first causes, according to Comte, should be left to religion or metaphysics (literally, that which is outside the scope of physics), and positivism should be limited to clear correlations between observable variables. The positivistic paradigm thus uses quantification to systematise the information generation process, which is ultimately to improve precision in the representation of parameters and the discernment of their relationships. It is used for cause-and-effect relationships. It is the ideal worldview for study that explains findings in terms of evidence or entities that are quantifiable (Fadhel, 2002).

Empiricism, determinism, parsimony, and generalisability are the four assumptions that according to Cohen, Manion, and Morrison (2000) underpin such observable outcomes. Determinism states that the events we see are the product of other causes. Empiricism holds that in order to analyse a research problem, we must be able to gather verifiable empirical data that support the theoretical framework you've selected for your investigation and allow you to verify the hypotheses you've developed. The Positivist theory presupposes parsimony, which applies to the researcher's efforts to adequately characterise the subject under study. Inductive conclusions should be able to extrapolate the results of a study conducted using the Positivist paradigm to other contexts, according to the generalisability principle (Kivunja & Kuyini, 2017).

While the positivistic model influenced educational research for many years in the latter part of the twentieth century, it has been criticised for not taking into account individuals' subjective states. It considers human behaviour to be passive, regulated, and dictated by the outside world. As a result, human beings are dehumanised without their knowledge or consent, and individualism and democracy are ignored when interpreting and viewing social reality. According to opponents of this paradigm, in the course of scientific inquiry, objectivity must be replaced by subjectivity. Anti-positivism, or naturalistic inquiry, arose as a result of this. Despite these criticisms, the current researcher is inclined to the positivist paradigm because, considering the topic, it was a pure scientific experiment he embarked on.

Research Design

The core of the hypotheses, the variables employed in the research, and the overall framework are all defined by the research design (Gay, 1996). Babbie and Mouton (2002) identified the design of a research as a plan or outline of how the research is to be performed. It furnishes procedural overview of any investigation to be performed. It consequently reflects the plan which sets out how to collect and analyse data relating to a given construct.

Two major experimental design groups were described by Gay (1992). These are:

1. According to the level of control they dispense for sources of external and internal validity, single variable designs are categorized as pre-experimental, quasi-experimental or true experimental designs and
2. Factorial designs, that essentially elaborate true experimental designs and allow at least two variables to be investigated separately and in interconnection with each other.

This research made use of the true-experimental research design. The implementation of an experimental treatment, or the modification of an independent variable, constitutes a true experiment. Other properties that characterise true experiments are randomisation and control group (Amedahe & Gyimah, 2016).

As a way of managing extraneous variables, only women with similar infertility attributes were involved in the study. The fertility levels of their spouses were also considered. The inclusion criteria involved similarities in the type of

infertility, tubal causes, ovarian issues, uterus issues, and semen consistency, among other things. Also, interactions between participants were eliminated through the use of different days for the therapies. The sensitive nature of the issue involved, did not even permit the women involved in the study to interact freely among themselves even within groups. Finally, all participants were encouraged to identify other conditions in their lives that appeared to increase or decrease their depression levels during the period of collecting the data. It was observed that all the participants remained in the study until the end and so the researcher did not encounter experimental mortality. This could be explained by the fact that the In Vitro Fertilisation (IVF) procedure which was part of the study served as motivation for the infertile depressed women, apart from the snacks, water and other incentives like giving them pens, hand sanitizers, etc. the researcher provided them, because they believed they stood the chance of getting pregnant by taking part in the research.

Study Area

The research was performed in the Greater Accra Region of Ghana. Anecdotal evidence indicates that more than 80% of Ghana's fertility centres are located in the Region aforementioned and that infertile couples mostly seek treatments in the said region, hence the decision to use the region. Infertile women in the region have similar problems just like their counterparts in the other regions of Ghana.

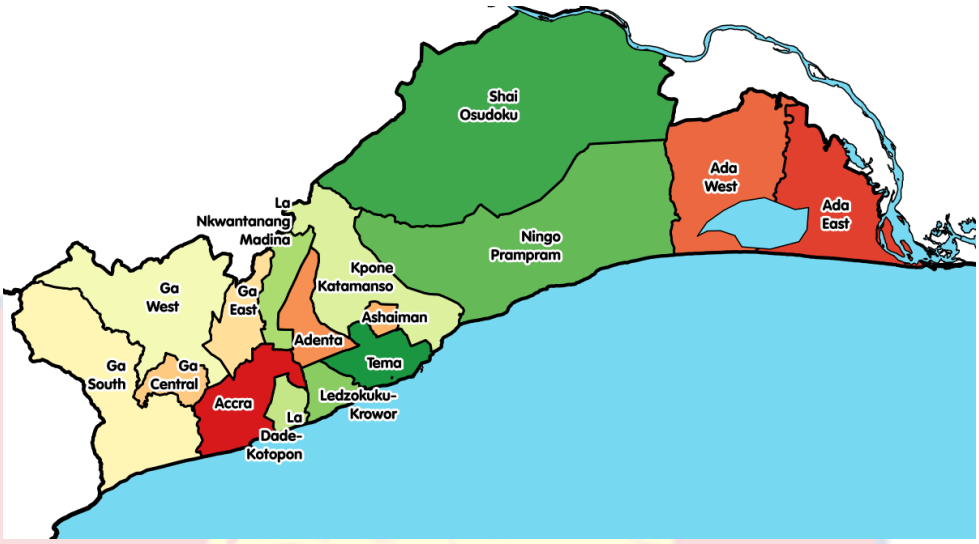

Figure 4: Map of Greater Accra Region
Source: https://www.google.com

Population

Population is the term for the large general group of many examples from which a researcher selects a sample, and it is typically used in theoretical contexts (Neuman, 2003). Also, Polit and Hungler (1996) are of the opinion that population of the sample represents the total number of cases meeting the prescribed set of criteria. These are the issues that the researcher wants to generalise his/her results on.

Adane (2013) maintains that the target population refers to the analytical units used for the data analysis, such as people, objects, occurrences, etc in a research. The target population is the researcher's community of interest. It is the category from which the study's findings are to be broadly generalised. The target population of the sample included all infertile women seeking care at the 37 Military Hospital. The total number was 106. The accessible research population involved all infertile depressed women going to the 37 Military Hospital, a public

health facility in the Greater Accra Region, from September 2021 to November 2021 for fertility care. The 37 Military Hospital is among the top public hospitals that are in the Greater Accra Region with its own Ethical Review Board.

Sampling Procedure

Sampling refers to the selection process for a segment of the population to represent the whole population in a research (Amedahe, 2000). It helps the investigator to research a relatively smaller number of units replacing the population targeted (Sarantakos, 1998).

The purposive sampling technique was the one used for selecting the Greater Accra Region and the health facility in this study. Anecdotal evidence indicates that infertile women in Ghana mostly go to the Greater Accra Region for fertility treatments. Since Ghana's IVF began in the mid-1990s by Dr. Mainoo, a number of other health facilities in Ghana, about 14 private clinics as of 2015, have begun to offer ARTs, primarily in the southern sector, near or around Accra (Gerrits, 2016).

To determine the severity of the depressive symptoms, all the infertile women attending the 37 Military Hospital during the data collection period (September 2021 to November 2021) numbering 106 were tested with the depression scale (BDI-II) as and when they reported for medical care and selected those who fell within the range (refer to Data Collection Instruments) that was of interest to the researcher. It was from this that the infertile depressed women totaling 61 were got out of which a final sample of 45 were taken for the study.

Furthermore, data on the uniformity in infertility levels of those who were found to be within the said range were collected from the health facility. It means collecting data on the status of their wombs, body mass index (BMI) levels, physical activity status, hormones and fallopian tubes, etc. Data on their partners' sperm parameters (motility, concentration, count and morphology) were also collected from the said hospital. All other relevant data that were necessary were also taken. Further information on the inclusion criteria is presented in Table 2.

Table 2: ***Inclusion Criteria***

Item	What was Expected
Anti-Mullerian Hormone (AMH)	*At least 2.0 for the infertile women or a donor*
Body Mass Index (BMI)	*Between 18.5 and 29*
Embryos Transfer	*Two (2) blastocysts*
Endometrium	*Free without fluid*
Fallopian Tubes	*Blocked or not without fluid/hydrosalpinx*
Hormones	*All normal*
IVF Treatment	*Ability to pay the highly discounted cost*
Morphology	*At least 20% normal*
Motility (P)	*At least 30%*
Ovaries	*Free from fluid (no cyst)*
Partner	*Consent from partner needed*
Sperm Concentration	*At least 15 million/ml*
Uterus	*Okay or with insignificant fibroid*

Source: Field Survey, (2021)

Also, random assignment approach was used to classify the women from the 37 Military Hospital who were found with depression, by the scale, into three categories (experimental—IPT & CBT—and control) using their characteristics and distributing the infertile depressed women evenly among the three groups. A sample size of 45 (15 for each group) was used for the study. In support of the selected sample for the control and experimental groups, Borg and Gall, as cited in Cohen, Manion and Morrison (2007), suggest that experimental methodologies require a sample of not fewer than 15 cases. Also, the US Department of Justice recommends a maximum group size of sixteen people (Linhorst, 2000). Therefore, the decision to have 15 participants in a group was not out of place.

Finally, purposive sampling procedure was employed to select one fertility centre, City of Hope Medical Complex, which undertook the IVF procedure for the women in all the groups. The identified fertility centres out of which one was selected are, Provita Specialist Hospital, Women's Hospital (Tema), Women's Hospital (Airport), Lister Hosp. and Fertility Centre, DEL International Hosp. and Fertility Centre, Finney Hosp. and Fertility Centre, Lapaz Community Hosp., Jubail Specialist Hosp., City of Hope Medical Complex, Family Health, Resolve Medical Services and GLENOF Fertility and Specialist Hospital. City of Hope Medical Complex was selected for the IVF treatment because the Medical Directors the researcher contacted in some of the other fertility centres were not willing to open their doors to me citing the sensitive nature of the issue under investigation mostly as the reason. Table 3 presents a summary of how the sample was taken:

Table 3- *Summary of Sample Taking*

37 Military Hospital	Group	Sample
Group 1	CBT Group	15
Group 2	IPT Group	15
Group 3	Control Group	15
Total		**45**

Source: Field Survey, (2021)

Data Collection Instruments

Instrumentation talks about the creation of field data-gathering methods or tools that generate appropriate data. They include questionnaires, schedule of interviews, testing etc. The BDI-II was modified by making some of the words simpler and including demographic characteristics to determine the depression levels of the participants due to the design of the research. A self-developed questionnaire was also employed for the results of the implantation.

BDI-II, as created by Beck, is a 21-Item multiple-choice and self-reported scale, and is one of the psychometric measures frequently employed to assess the level of depression among women experiencing infertility. It includes issues related to signs of depression such as irritability and hopelessness. Since it is structured to represent depth of depression, it can track improvements over time.

Interpreting the depression scale, a score within 0 – 10 would be considered as normal; 11 – 16 as mild mood disturbance; 17 – 20 as borderline clinical depression; 21 – 30 as moderate depression; 31 – 40 seen as severe depression while over 40 is seen as extreme depression. Thirty (30) participants with mild (11-16)

up to moderate (21-30) depression were selected for treatment (CBT and IPT) in this study. Fifteen (15) of them were taken through 12 sessions of CBT for 60 minutes each while the other 15 women were taken through 12 sessions of Interpersonal Therapy also for 60 minutes per session. The last batch of the sample, 15 infertile women with mild up to moderate depression, were placed in a control group without undergoing any therapy.

Validity and Reliability of the Instruments

The explanation for validity for quantitative research is that a measurement tool actually measures what it was designed for (Bryman, 2008). Silverman (2009) claimed that it is a way of accurately representing the phenomena to which they relate. Validity and reliability are key characteristics of any study (Robson, 2002; Creswell, 2003). Indicators of an instrument's consistency with various groups of respondents throughout time are said to be reliability and it discusses precision as well as accuracy (Cohen, Manion & Morrison, 2004). The reliability of the scale, thus, BDI-II had been determined in other jurisdictions and found to be .80 (Beck, Steer and Brown, 1996). Pilot test of BDI-II and the self constructed instrument for measuring implantation levels was conducted using twelve infertile women attending the Tema General Hospital in the Greater Accra Region since they bear similar characteristics as the research group for the study and the reliabilities determined to be .816 and .779 respectively. The researcher established the reliability using the Cronbach Alpha reliability coefficient. Julious (2005) recommends a minimum sample of 12 people per treatment arm when estimating the sample for a pilot experiment. The acceptability of the coefficient of reliability

has to be consistent with the Sekaran (2003) view who indicates that Alpha values are appropriate in the .7 range whereas those above .8 are fine.

Again, the questionnaires (BDI-II and the self-constructed instrument) were given to the supervisors of the researcher and some other lecturers in the Departments of Guidance and Counselling and Psychology and Education at UCC for their expert judgment and evaluation. The Institutional Review Board of the 37 Military Hospital also gave their expert judgement on the questionnaires. To accomplish the study's objective, both questionnaires were refined based on their comments and suggestions.

Data Collection Procedures

Data were initially gathered from all the infertile women who attended the 37 Military Hospital during the data collection period numbering 106. This was scaled down to 45 after their depression levels had been determined and the selection criteria considered. The BDI-II instrument as well as the first part of the "implantation instrument" which dealt with the fertility status were administered to the infertile women as and when they reported to the 37 Military Hospital for fertility care after the required relationship had been formed with them. The researcher encouraged them to give truthful answers because the analysis will be for academic purposes as well as helping them control their depression levels and give them the opportunity to have possibly higher implantation.

In order to do this, the researcher secured an introduction letter from the Head of the Guidance and Counselling Department. It described, among other things, privacy and the response of the respondents in confidence. The researcher

trained two nurses who were mostly in charge of attending to the infertile patients before they saw the Doctor in the health facility to help gather the data. The researcher was frequently present with the helpers to guarantee understanding of how the scale was conducted at the initial stages, as they administered the scale to the respondents.

The treatment procedure went through three phases as summarised below:

Phase 1: Pre-Counselling Phase

This phase involved administering the participants' inventory of depression and gathering the baseline data as mentioned above.

This was used to position them in the experimental and control groups.

Phase 2: Counselling Phase

Two groups out of the three were taken through either CBT or IPT. The remaining group was the control group. Participants in the control group did not receive any therapy. However, to satisfy professional ethics, the researcher hopes to take the control group through the most effective therapy after the study.

CBT Group

The CBT group went through 12 therapy sessions as briefly listed below:

Session 1 was used for establishment of relationship, set goals for the therapy and to choose leaders.

Session 2 was used to discuss the nature of infertility and its psychological consequences.

In session 3, depression and the safe handling of reality was discussed with participants.

Sessions 4 and 5 were devoted to the nature of CBT, layers of cognition and to help the participants identify their cognitive distortions.

Session 6 was used to increase thoughts that improve ones mood

In session 7, participants were helped to identify the things they do that impact their mood.

Session 8: The focus here was on how participants' mood is influenced by their interaction with other people. In this session, we discussed how participants' thoughts, behaviour and emotions influence their relationships, and how these three aspects are affected by their relationships with significant others in their lives. It is important to first assess how these three areas are influenced by your relationships before worrying about how they are when you are alone.

In sessions 9-10, the participants were taken through the therapeutic techniques for changing maladaptive thoughts using cognitive restructuring.

Session 11 was used to assist the participants to set goals by making their own strategy for managing depression.

The last session was used to review the previous sessions and to terminate the therapy.

IPT Group

The IPT group participants were also taken through twelve (12) therapy sessions of sixty (60) minutes per session following the treatment manual of Weissman et al. (2018) which was purchased from the Oxford University Press.

The sessions are briefly listed below:

Sessions 1-3 were used to emphasise the medical model of depressive disorder as a supplement to infertility, encourage the therapeutic partnership, provide psychoeducation regarding depression, assign the patient the "sick position," examine relationship dynamics with a focus on current relationships, and so on. To clarify the interpersonal existence of the patient, therapist and patients explored potential conflict points and started an inventory of past and present relationships. Finally, the patients and therapist collaborated to identify the primary source of tension in the patients' depression and decided to make it the primary subject of counselling in subsequent sessions.

Sessions 4-10 were used to discuss the four IPT problem areas narrowing the discussion and giving additional sessions to Role Transitions which involve their medical condition, infertility. The sessions were also used to resolve the perceived issue (e.g., difficulty adapting to loss of reproductive ability), normalise affect, and develop social skills and supports (Weissman et al. 2018). Such issues can easily be applied in a group environment. In order to successfully control events, the following group processes were examined at this level: interaction (patients learnt communication with each another), distinction (patients understood tension and learnt mechanisms for coping) and finally the work stage [development of intimacy] (Wilfley et al., 1998).

Sessions 11-12 concentrated on how patients felt about being terminated, an analysis of their recovery progress, and developing techniques for dealing with

potential interpersonal stressors. The patients were able to move through the stages of developing close attachments, maintaining long-term relationships, and ending them thanks to these stages of group relationship formation (Wilfley et al., 1998).

For details of the treatment plans, see Appendices C and D.

Phase 3: Post-Counselling Phase

Here, two weeks after the end of therapy, the depression inventory was distributed to all the participants to assess the post-test scores. This was to assess how successful the interventions were.

Finally, in the experimental and control classes, all infertile women were helped to undergo fertility treatment, IVF, in a purposively selected fertility centre after which data on their human chorionic gonadotropin (hCG) levels were collected from the said health facility two weeks after the IVF procedure to determine implantations. The human chorionic gonadotropin (hCG) quantitative test, tests the precise blood level of hCG. During pregnancy, hCG is a hormone produced in the body. A negative result from hCG means that a woman is unlikely to be pregnant.

Data Processing and Analysis

Patton (2002) noted that the empirical data analysis aims at making sense of vast quantities of data, reducing the volume of information, identifying significant trends and creating a structure for communicating the meaning of what the data reveals. In accordance with what is stipulated in the scale's manual, data obtained from participants on their depression levels were analysed. Again, the analysis of the research hypotheses used statistical tools.

The two-way Analysis of Variance (ANOVA) was employed to test research hypothesis one as well as research hypothesis two. For hypothesis two, the two-way ANOVA was used on the difference between the pre-test and post-test scores. Also, the one-way ANOVA was for research hypothesis three. Finally, the logistic regression was employed for research hypothesis four.

Ethical Consideration

Ethical approvals were secured from the Ethics Review Board at UCC and the Institutional Review Board of the 37 Military Hospital, most notably on the ethical concerns of the report. Letters to that effect given to the researcher had reference numbers CES-ERB/ucc-edu/V5/21-75 and 37MH-IRB/FP/IPN/547/21 respectively. This was done after successfully defending the proposal.

Research ethics have to do with the basic rules of conduct expected when conducting research. Researchers have moral duty to guard against harm to the participants. The researcher shall have primary responsibility for performing ethical research. Punch (2009) believed that because social scientists work with human data, they should be especially aware of ethical issues.

The research addressed all ethical issues, including explicitly communicating to the participants the intent of the study, informed consent, deception and confidentiality of the responses of the respondents.

Informed consent was one of the concerns involved in this study. It offered prospective participants the ability to approve or reject participation in the study based on their individual preferences and convictions. It explains the need for participants to recognise the goals, priorities and possible harm that may result from

such participation (Seidman, 2006). Cohen et al (2004) and also Mertens (2010), claimed that it emerges out of the right of individual's freedom. Each participant was carefully examined for the intent of the study before being involved. When volunteers are furnished with false knowledge regarding study objectives, deception has occurred. It could come in the form of (i) intentional deception, like planned manipulations in outdoor environments, using confederates, or misleading directions; or (ii) deception by omission, like creating uncertainty or failing to expose all study details.

The study also strongly took into account the privacy of research respondents. Oliver (2010) affirmed that anonymity is an important part in ethics of research, as it offers participants the ability to protect their identity. Initials of the names of participants were used for purposes of identification. Although telephone numbers of participants were taken during the selection process to call the participants whose scores would fall within the scope of interest to the researcher in order to position them in the control and experimental classes, the numbers were stored using special codes involving letters and numbers created by the researcher for all the participants in order to ensure anonymity.

With regards to confidentiality, all efforts were made to keep the participants' answers private. Respondents were informed that their answers would be maintained confidential; no other person apart from those assisting the researcher would have the privilege to the information given and no name of any respondent would be reported in the study. In view of this, the filled questionnaires

from the individual participants were properly secured in a safe in the office of the researcher.

Freedom to withdraw: All participants should be free to withdraw from the trial at any time if they believe their interests are best served outside of the framework. I continually mentioned these to the participants.

Protection from harm and debriefing: the researcher ensured that those who participated in the research were not distressed. They were safeguarded against both mental and physical damage.

Removing harmful consequences/risks: A code of ethics that requires researchers to ensure that participants in potentially harmful activities leave a study in the same emotional state as when they arrived. By mitigating research risks before the study starts and offering an in-depth debriefing after the study is completed, investigators are obligated to relieve any feelings of alienation, anger, negativity, and so on. With regards to the current circumstances on **COVID-19**, all the protocols were adhered to. This includes limiting contacts with participants during the administration of the questionnaires and maintaining the required national directives on social/physical distancing. Respondents were educated on the national preventive directives on COVID-19 before the group sessions. All participants selected for the group sessions underwent hand washing with soap under running water before each group session. Alcohol-based hand sanitizers were also provided at the study site. The researcher also ensured that all participants wore face masks during the data collection period as well as during the counselling sessions after they had been taught how to wear, remove and dispose them off and

how to handle the reusable ones. Facemasks were provided to participants who did not have at no cost to them. Any restrictions to movements imposed by national or local COVID-19 response team were adhered to by the participants and the researcher.

The City of Hope Medical Complex which undertook the IVF for the participants made them sign a separate consent form which among other things addressed all the other medical/health risks inherent in the study. Some of the risks include egg-retrieval procedure complications, ovarian hyperstimulation syndrome (OHSS), the possibility of bloating, multiple births (If more than one embryo is transplanted into a woman's uterus during IVF, the woman is more likely to have several children), premature delivery, low birth weight, ectopic pregnancy, miscarriage and birth defects.

Follow-Up

The research participants in the control group are currently being taken through CBT to satisfy ethics while all those who did not achieve implantation are currently being given further counselling to help them manage the situation. Those who did not achieve implantation were assured that they stood the chance of repeating the IVF treatment at the rebate figure even though the research was over which gave them some hope. Also, I hope to possibly follow up on those who achieved implantation beyond that stage to find out those who will achieve viable pregnancy and those who will have healthy babies.

Chapter Summary

The research aimed to find out the effect CBT and IPT could have in the achievement of implantation among depressed infertile women in Ghana. The research made use of the true experimental research design. In order to obtain the participants for the analysis, the purposive sampling and random assignment techniques were used.

The participants were divided into three groups (two experimental and one control), after which the members of the experimental groups were taken through some counselling to assess the effect of cognitive behavioural and interpersonal treatments on their depressive and implantation levels. The findings were evaluated using the two-way ANOVA, one-way ANOVA and logistic regression.

CHAPTER FOUR

RESULTS AND DISCUSSION

The results of the analysis are presented in this chapter, along with a discussion of the study's findings. The analysis was made using percentages, frequencies, the two-way ANOVA, one-way ANOVA and logistic regression. All tests were conducted at a significance level of .05. A total of 45 infertile women took part in the research.

Advance Organiser

The study focused on implantation among infertile depressed women after being taken through two therapies (CBT and IPT). Details of the objectives set out in this study and the underlying activities are contained in Table 4:

Table 4: *Objectives and Activities of the Study*

Goal/Objective	Activity Performed
To ascertain the possible change in the depression levels among infertile women after experiencing CBT	The depression levels of 15 infertile women assigned to the CBT Group were initially taken using BDI-II after which they were taken through CBT. Their depression levels were taken again two weeks after the therapy to see if the therapy had a positive effect on the women by helping them have a significant reduction in their depressive levels

To compare the depression levels of infertile women in the CBT group after going through the therapy and those in the control group to ascertain whether the depression levels were similar	The depression levels of infertile women assigned to the CBT Group as well as those in the Control Group were initially taken using BDI-II. The CBT Group was taken through CBT but no therapy was given to the Control Group. The depression levels of participants in both groups were taken again two weeks after the CBT therapy to see if those who experienced the CBT therapy had significantly lower depression levels as compared to their counterparts in the Control Group
To determine whether there was any change in the depression levels among infertile women after experiencing IPT	The depression levels of 15 infertile women assigned to the IPT Group were initially taken using BDI-II after which they were taken through IPT. Their depression levels were taken again two weeks after the therapy to see if the therapy had a positive effect on the women by helping them have a significant reduction in their depressive levels
To compare the depression levels of infertile women in the IPT group after going through the therapy and those in the control group to ascertain whether the depression levels were similar	The depression levels of infertile women assigned to the IPT Group as well as those in the Control Group were initially taken using BDI-II. The IPT Group was taken through IPT but no therapy was given to the Control Group. The depression levels of participants in both groups were taken again two weeks after the IPT therapy to see if those who experienced the IPT therapy had significantly lower depression levels as compared to their counterparts in the Control Group

To find out whether demographic characteristics (age, period of marriage and educational attainment) had some influence on the pre-test depression mean scores of infertile women	The depression levels of all the 45 infertile women in the study were initially taken using BDI-II. The depression levels were analysed in connection with their ages, period of marriage and educational attainment. This was to see which age group was more depressed; which duration of marriage resulted in higher depression levels and which educational attainment group had significantly lower depression levels.
To find out whether demographic characteristics had some influence on infertile women's post-test depression mean scores in the therapy groups (CBT and IPT).	The depression levels of 15 infertile women assigned to the CBT and IPT Groups were analysed in connection with their ages, duration of marriage and educational attainment after they had experienced the therapies. This was to see which age group assimilated the therapy more thereby resulting in a significantly lower depressive levels as compared to the other age groups; which duration of marriage and which educational attainment groups had significantly lower depression levels.
To examine whether infertile women taken through CBT and IPT achieved similar implantation as their counterparts in the control group	The depression levels of infertile women assigned to the CBT and IPT Groups as well as those in the Control Group were initially taken using BDI-II. The CBT Group was taken through CBT while the IPT group were taken through IPT but no therapy was given to the Control Group. The depression levels of participants in the three groups were taken again two weeks after the therapies to see if those who experienced CBT and

	IPT therapies had significantly lower depression levels as compared to their counterparts in the Control Group. Finally, all the participants in the three Groups were made to undergo IVF treatment to determine which group had significantly higher implantation.
To determine whether implantation in infertile women taken through CBT could be the same as those taken through IPT	Participants in the CBT and IPT Groups were made to undergo IVF treatment after the therapies to determine which group had significantly higher implantation.
To determine whether lower depression levels predict higher implantation	The difference in the pre-test and post-test depression mean scores in the three groups (CBT, IPT and Control) were analysed in relation to post-test implantation to see whether depression levels predict implantation success

Source: Field Survey, (2021)

Results of the Study

The following are the findings of the research:

Table 5 shows the demographic characteristics of the study's participants.

Table 5: *Distribution of Respondents based on Age, Duration of Marriage and Educational Level*

Variable	Frequency	Percentage (%)
Age		
18-35	17	37.8
36-43	19	42.2
Over 43	9	20.0
Total	**45**	**100.0**
Duration of marriage		
0-10 years	23	51.1
11-20 years	16	35.6
Over 20 years	6	13.3
Total	**45**	**100.0**
Educational Qualification		
None	7	15.6
JHS	10	22.2
SHS	9	20.0
Tertiary	19	42.2
Total	**45**	**100.0**

Source: Field Survey, (2021)

From Table 5, 37.8 percent of the respondents were between the ages of 18 and 35; 42.2 percent of them were between the ages of 36 and 43; while 20 percent

of the respondents were over 43 years. Fertility levels were used in selecting the ranges. Women between ages 18 and 35 are said to be very fertile while those between ages 36 and 43 have reduced fertility levels. For women over 43 years, it is a near impossibility to achieve pregnancy naturally unless with the assistance of IVF and other forms of fertility treatments. In terms of ranking from the highest to the lowest, the number of respondents whose ages fell within 36 and 43 years were first; second were those whose ages were from 18 to 35 years while respondents whose ages were over 43 years placed last. It was observed that significant number of the infertile women got married beyond age 30 and therefore started a serious search for a child around age 33. Hence the high percentage (42.2 percent) of depressed infertile women between the ages of 36 and 43. The smaller percentage (20.0 percent) of infertile women whose ages were over 43 years can be explained by the fact that beyond certain age some infertile women become fed up and therefore stop seeking healthcare.

Table 5 also shows that 51.1 percent of the respondents had been married for 10 years and below; 35.6% of them had their marriage from 11 to 20 years while 13.3% of the respondents had been married for more than 20 years. The desire to have a child and the perceived pressure from significant others in the lives of some infertile women appear to be high in the first few years of marriage and therefore infertile women are more likely to go to hospitals for help. Hence, the high percentage (51.1%) of infertile women whose marriages feel within the range of 0-10 years of marriage.

Also, from Table 5, 15.6 percent of the respondents had received no formal education; 22.2 had received education up to the JHS level; 20.0 had received education up to the SHS level while 42.2 percent of the respondents had experienced tertiary education. The high percentage of infertile women with college education could be due to the high fertility treatment cost in Ghana, as individuals with tertiary education are more likely to be from the middle to upper classes, and it is assumed that they can afford the treatment. Even though there was huge rebate on the IVF for the purposes of the research, some of the depressed infertile women were not able to afford the cost and therefore were dropped and all those who were dropped had education below the tertiary level. Since ability to pay for the fertility treatment was a criterion for selection, it is not so surprising that significant number of the participants fell into this category.

Table 6: *Distribution of Depressed Respondents According to Scale*

Hospital	No. of Participants	Depressed	Percentage(%)	Referred
37 Military	106	61	58	5

Source: Field Survey, (2021)

From Table 6, 106 infertile women from the 37 Military Hospital took part in the study. Sixty-one of them, representing 58% were depressed according to the scale used. This means they had depression score of 11 and above. Five out of the 61 infertile depressed women who had severe (score of 31 – 40) and extreme (score

of over 40) forms of depression according to the scale were referred to a Clinical Psychologist. Table 7 gives further details of those selected for the study.

Table 7: *Participants' Depression Scores*

Depression Score	Interpretation	Number Affected
0-10	Normal Depression	45
11-16	Mild Mood Disturbance	27
17-20	Borderline Clinical Depression.	13
21-30	Moderate Depression	16
31-40	Severe Depression	4
Over 40	Extreme Depression	1
	Total	***106***

Source: Field Survey, (2021)

Table 7 shows that 45 of the participants, representing 42% of the Infertile Women who were involved had normal depression. The number of infertile women whose depression levels were of interest to the researcher was 56 (27+13+16). Thus those who had depression score from 11 to 30. Forty-four percent of the participants had Mild Mood Disturbance, 21.3% had Borderline Clinical Depression and 26.2% had Moderate Depression.

Forty-nine of the 56 women, representing 88% of depressed infertile women whose depression levels were of interest to the researcher, met the other inclusion criteria as contained in Table 2. Forty-five out of the 49 was chosen as the sample size with 15 for each of CBT, IPT and control. The other four qualified participants were assisted to do the IVF which served as the key motivator for

participating in the study on their own at the reduced cost since they were interested in it.

Tests of Normality and Homogeneity of Variance

Two key assumptions need to be fulfilled before one uses Analysis of Variance (ANOVA) Test: test for normality and test for homogeneity of variance. Q-Q plots and histograms can be used to visually evaluate the hypothesis that your data were sampled from a Normal distribution. Normally distributed data appears as a straight line on a Q-Q plot. On the other hand, the Levene's test is used to check whether the variances are equivalent. The variances are really equal, and there is no difference in variances between the groups, according to a non-significant p value of Levene's test. It does not follow that the null hypothesis (equal population variances) is correct, though. Figures 5, 6 and 7 depict the normality tests for pre-test, post-test and implantation respectively while Tables 8, 9 and 10 show the homogeneity of variance tests for pre-test, post-test and implantation respectively.

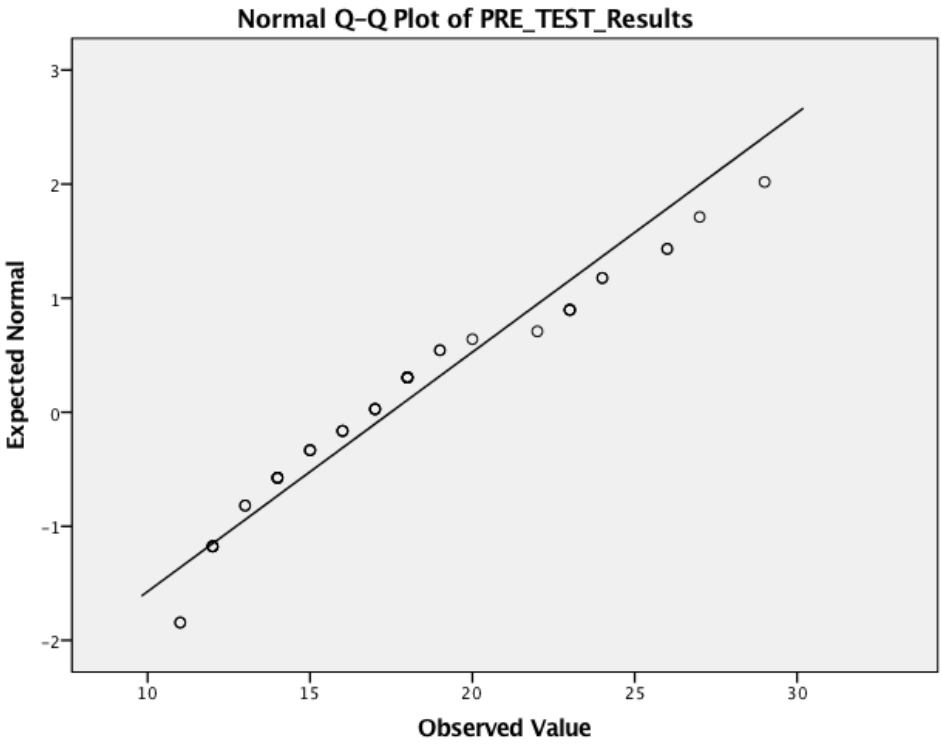

Figure 5: Pre-test of Normality
Source: Field Survey, (2021)

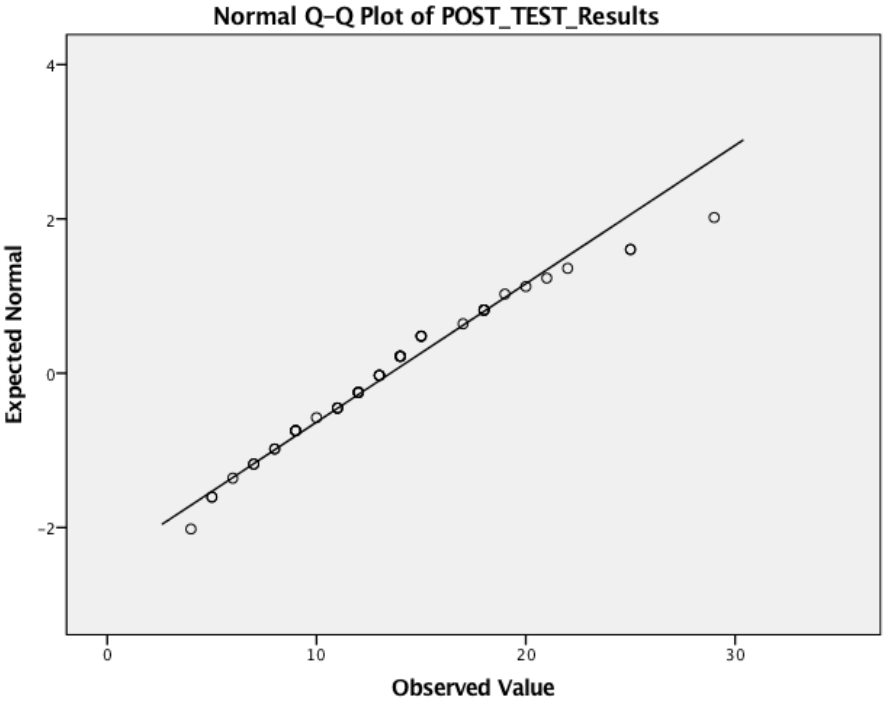

Figure 6: Post-test of Normality
Source: Field Survey, (2021)

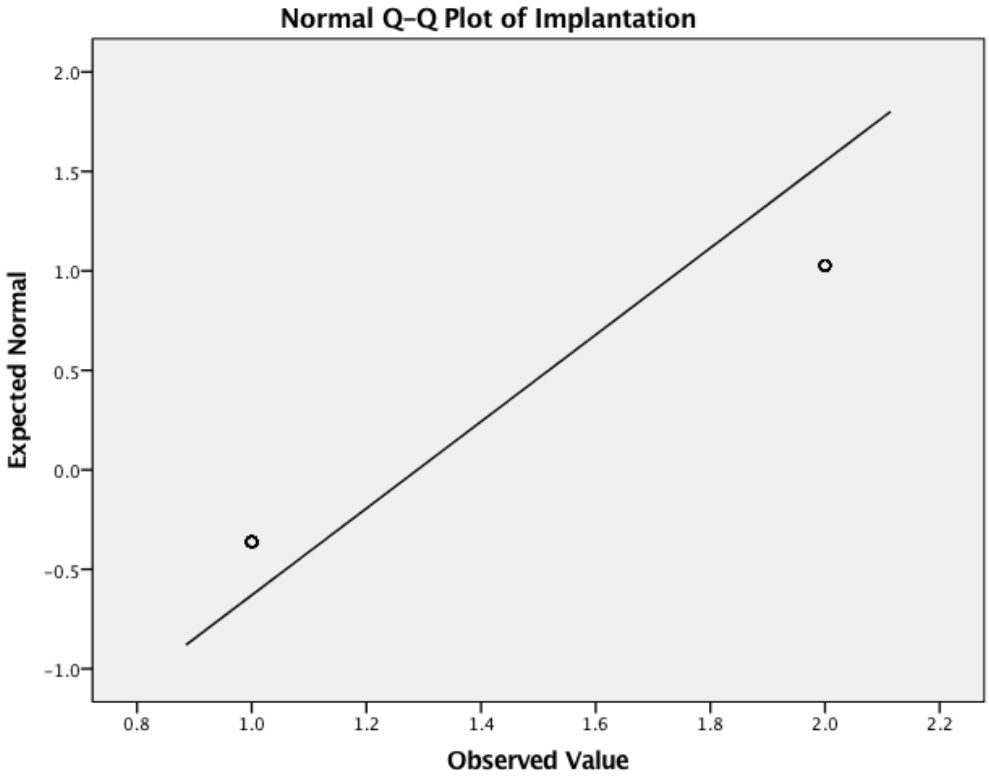

Figure 7: Implantation Normality Test
Source: Field Survey, (2021)

Table 8- *Pre-Test of Homogeneity of Variance.*

Levene Statistic	df1	df2	Sig. (2-tailed)
0.021	2	42	.979

Source: Field Survey, (2021)

Table 9- *Post-Test of Homogeneity of Variance.*

Levene Statistic	df1	df2	Sig. (2-tailed)
0.833	2	42	.442

Source: Field Survey, (2021)

Table 10- *Implantation Test of Homogeneity of Variance.*

Levene Statistic	df1	df2	Sig. (2-tailed)
0.714	2	42	.536

Source: Field Survey, (2021)

From Figures 5, 6 and 7, it can be observed that there is normal distribution among the three data sets while Tables 8, 9 and 10 show homogeneity of variances among the said data. Therefore, it is correct to use the various statistical tools for the analysis.

Research Hypothesis 1

$H_0$1: There is no significant difference in the pre-test depression mean scores of infertile women in CBT, IPT and Control groups on the basis of:

a. Age

b. Length of Marriage and

c. Educational Qualification.

H_A1: There is significant difference in the pre-test depression mean scores of infertile women in the CBT, IPT and Control groups on the basis of:

a. Age

b. Length of Marriage and

c. Educational Qualification

First of all, this hypothesis aimed at finding out the significant difference in the pre-test depression mean scores of infertile women in the CBT, IPT and Control groups on the basis of three demographic characteristics (Age, Length of Marriage and Educational Qualification). It was to investigate whether age, marital length, and educational attainment had a significant impact on the depression mean scores of infertile women at the pre-test stage. In other words, would the depression levels of infertile women who had advanced in age be significantly higher than those whose ages were lower? Would infertile women who had been married for long be more depressed than those who recently got married? Would the depression levels of infertile women with lower levels of education be significantly higher than those with higher education? Hypothesis one was meant to address all these questions. Also, hypothesis one was meant to investigate whether depression levels were similar among infertile women in the groups (CBT, IPT and Control) at the pre-test stage.

The hypothesis was tested using two-way ANOVA performed at a significance threshold of .05, and the results are indicated in Tables 11 and 12. The dependent variable was pre-test depression mean scores. The groups and the three demographic characteristics were the independent variables.

Table 11 - Pre-Test Descriptive Statistics

Group	N	Mean	Std. Deviation
CBT	15	17.40	4.72
CONTROL	15	18.07	4.73
IPT	15	17.00	5.10
Total	45	17.49	4.85

Table 12 - Pre-Tests of Between-Subjects Effects

Dependent Variable: PRE-TEST Results

Source	Type III Sum of Squares	df	Mean Squares	F	Sig.	Partial Eta Squared
Corrected Model	740.578[a]	34	21.782	.842	.667	.741
Intercept	8415.242	1	8415.242	325.332	.000	.970
GROUP	11.853	2	5.927	.229	.799	.044
Age	65.050	2	32.525	1.257	.326	.201
Duration of marriage	58.430	2	29.215	1.129	.361	.184
Level of education	62.345	3	20.782	.803	.520	.194
Error	258.667	10	25.867			
Total	14763.000	45				
Corrected Total	999.244	44				

a. R Squared = .741 (Adjusted R Squared = -.139)

Table 12 indicates that pre-test scores did not vary among participants in the CBT, IPT and Control groups ($F_{(2, 10)}$ =.229, p>.05, η^2=.044). This means that at pre-test, the participants in the different groups had similar levels of depression. Concerning the various demographic variables, it can be seen from the table that there was no significant difference in the pre-test depression mean scores of infertile women in CBT, IPT and Control groups on the basis of age ($F_{(2, 10)}$=1.257,

p>.05, η^2=.201). Similarly, there was no significant difference in the pre-test depression mean scores of infertile women in CBT, IPT and Control groups on the basis of duration of marriage ($F_{(2, 10)}$=1.129, p>.05, η^2=.184). In terms of level of education, there was also no significant difference in the pre-test depression mean scores of infertile women in CBT, IPT and Control groups ($F_{(3, 10)}$=.803, p>.05, η^2=.194).

From the results, therefore, it can be said that there was no significant difference in the pre-test depression mean scores of infertile women in CBT, IPT and Control groups on the basis of age, duration of marriage and level of education. Demographic variables, therefore, do not have a significant impact on the pre-test depression mean scores of infertile women, according to Table 12. This means that similar depression levels exist among infertile women whether they have advanced in age or not; whether they have been married for long or not; and whether they have higher education or not. The null hypothesis, on this basis, which states that, there is no significant difference in the pre-test depression mean scores of infertile women in CBT, IPT and Control groups on the basis of Age, Length of Marriage and Educational Qualification is retained. Since no significant difference was found, no post-hoc analysis was carried out.

Research Hypothesis 2

$H_0$2: There is no significant difference in the post-test depression mean scores of infertile women in CBT, IPT and Control groups on the basis of:

a. Age

b. Length of Marriage and

c. Educational Qualification.

H_A2: There is significant difference in the post-test depression mean scores of infertile women in the CBT, IPT and Control groups on the basis of:

a. Age

b. Length of Marriage and

c. Educational Qualification

One aim of this hypothesis was to find out the significant difference in the post-test depression mean scores of infertile women in the CBT, IPT and Control groups on the basis of three demographic characteristics. This was to enable the researcher find out whether the depressive levels of the infertile women in the CBT group could reduce after going through the therapy. Also, it was meant to see if there was a significant difference in the post-test depression mean scores of infertile women who received CBT versus those who did not. Would there be a reduction in the depressive levels of the infertile women who were taken through CBT while the depressive levels of their counterparts in the control group remained the same? The answer to this question was what hypothesis 2 was meant to address. The third research aim was to see if there was a significant change in the pre-test and post-test depression mean scores of infertile women who received IPT. In other words,

the researcher wanted to see whether the depressive levels of the infertile women could possibly reduce after experiencing IPT. Also, Hypothesis Four was to see if there was a significant difference in the depression mean scores of infertile women who received IPT at post-test versus those who did not. Meaning the researcher wanted to find out whether the depressive levels of the infertile women who received IPT could possibly reduce while those of their counterparts in the control group would remain the same.

Furthermore, Age, Duration of Marriage, and Educational Qualification of infertile women in the therapy groups (CBT and IPT) at the post-test stage were investigated to see if they had a significant impact on depression mean scores. The objective of this was to see whether the therapies (CBT and IPT) could work more on depressed infertile women who had advanced in age or on those who had been married for long or on those with higher educational qualification. Would CBT and IPT work more on depressed infertile women who had advanced in age as against their counterparts with lower ages? Would the therapies work more on depressed infertile women who had been married for long as against those who recently got married? Would the highly educated depressed infertile women assimilate the therapies and thereby help reduce their depressive levels more than those with lower levels of education? Hypothesis two was meant to address all these questions.

The hypothesis was tested using two-way ANOVA on the difference between the pre-test and post-test depression mean scores. The dependent variable was the depression mean scores. The groups and the three demographic characteristics were the independent variables. The two-way ANOVA was

performed at a significance threshold of .05, and the results are indicated in Tables 14 and 15.

The results of the descriptive statistics for the different groups at post-test are shown in Table 13.

Table 13 - Post-Test Descriptive Statistics

Group	N	Mean	Std. Deviation
CBT	15	10.07	4.383
CONTROL	15	17.27	5.587
IPT	15	13.27	4.399
Total	45	13.53	5.574

Table 14 – Post-Test of Between-Subjects Effects

Dependent Variable: DIFFPOSTANDPRE

Source	Type III Sum of Squares	df	Mean Squares	F	Sig.	Partial Eta Squared
Corrected Model	1088.494[a]	34	32.015	2.681	.050	.901
Intercept	362.716	1	362.716	30.374	.000	.752
GROUP	227.729	2	113.864	9.535	.005	.656
Age	105.465	2	52.732	4.416	.052	.469
Duration of marriage	26.834	2	13.417	1.124	.363	.183
Level of education	84.123	3	28.041	2.348	.134	.413
Error	119.417	10	11.942			
Total	1912.000	45				
Corrected Total	1207.911	44				

a. R Squared = .901 (Adjusted R Squared = .565)

From Table 14, it can be seen that there is a significant difference in the post-test depression scores of participants on the basis of their groups ($F_{(2, 10)}$ =9.535, p<.05, η^2=.656). This means that at post-test, the participants in the

different groups had different levels of depression. The p-value of 0.005 is less than the .05 significant level. This means that there was a statistically significant difference in the mean scores of the three groups (CBT, IPT and Control).

Concerning the various demographic variables, it can be seen from the table that there was no significant difference in the post-test depression mean scores of infertile women in CBT, IPT and Control groups on the basis of age ($F_{(2, 10)}$=4.416, p>.05, η^2=.469). Similarly, there was no significant difference in the post-test depression mean scores of infertile women in CBT, IPT and Control groups on the basis of duration of marriage ($F_{(2, 10)}$=1.124, p>.05, η^2=.183). In terms of level of education, there was also no significant difference in the post-test depression mean scores of infertile women in the CBT, IPT and Control groups ($F_{(3, 10)}$=2.348, p>.05, η^2=.413).

From the results, therefore, it can be said that there was no significant difference in the post-test depression mean scores of infertile women in the CBT, IPT and Control groups on the basis of age, duration of marriage and level of education. Demographic characteristics do not have a significant impact on infertile women's post-test depression mean scores in the CBT group, according to Table 14. The therapy works similarly in depressed infertile women across all age groups. Again, CBT works similarly in depressed infertile women whether they have been married for long or not. Finally, the therapy works similarly in depressed infertile women irrespective of their educational background. Also, according to Table 14, the post-test depression mean scores of infertile women in the IPT group are unaffected by demographic factors. IPT works similarly in infertile women across

all age groups. Again, IPT works similarly in infertile women whether they have been married for long or not. Finally, the therapy works similarly in infertile women irrespective of their educational background.

Since a significant difference was found in the mean scores of the three groups (CBT, IPT and Control), post-hoc test was conducted. Tukey's Post-Hoc test was conducted and the results are shown in Table 15.

Table 15 - Multiple Comparisons

Dependent Variable: DIFFPOSTANDPRE

Tukey HSD

(I) GROUP	(J) GROUP	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
CBT	CONTROL	-7.60*	1.262	.000	-11.06	-4.14
	IPT	-2.53	1.262	.161	-5.99	.93
CONTROL	CBT	7.60*	1.262	.000	4.14	11.06
	IPT	5.07*	1.262	.006	1.61	8.53
IPT	CBT	2.53	1.262	.161	-.93	5.99
	CONTROL	-5.07*	1.262	.006	-8.53	-1.61

Based on observed means.
The error term is Mean Square(Error) = 11.942.
*. The mean difference is significant at the .05 level.

The participants in the CBT group and those in the Control group differ significantly (p=.000), as shown in Table 15 (participants in the CBT group). Additionally, it has been noted that there is a significant difference between the IPT group participants and the Control group participants (p=.006). Other than this, there was no discernible difference between the CBT group and the IPT group participants (p=.161). This means that the mean scores of the participants who were

in the CBT group as well as those in the IPT group were different from those in the Control group. Specifically, the mean score of the Control group was higher than those in the CBT and IPT groups.

The difference between pre-test and post-test scores of infertile women who received CBT was significant. This is understandable because pre-test depression ratings of 17.40 (Table 11) for infertile women were greater than post-test depression scores of 10.07 (Table 13) for CBT. The relevance of this finding is that infertile women's depression levels decreased significantly following CBT, indicating that the treatment was effective. As a result, the treatment administered accounts for the disparity. Also, Tables 11 and 13 show that there is a significant difference in the post-test depression mean scores of infertile women who received CBT and those who did not. Women in the CBT group had a lower mean depression score (from 17.40 to 10.07) than those in the control group (18.07 to 17.27).

In respect of IPT, Tables 11 and 13 show that there is a significant difference in the pre-test and post-test depression mean scores of infertile women who received IPT. The mean depression score of the infertile women in the IPT group reduced to 13.27 at post-test as against the score of 17.00 at the pre-test stage. Also, Tables 11 and 13 show that there is a significant difference in the post-test depression mean scores of infertile women who received IPT and those who did not. Women in the IPT group had a lower mean depression score (from 17.00 to 13.27) than those in the control group who had a depression mean score of 18.07 at pre-test reducing to 17.27 at post-test.

It is important to note from Tables 11, 12, 13, 14 and 15 that even though the depression levels of the infertile women in both the CBT and IPT groups reduced significantly after the therapies as against their counterparts in the control group, the reduction in the CBT group was more than that in the IPT group with reduced depression mean scores of 7.33 (17.40-10.07) and 3.73 (17.00-13.27) respectively. This probably means that CBT worked more on the infertile women than IPT.

Research Hypothesis 3

$H_0$3: There is no significant difference in achieving implantation among depressed infertile women taken through CBT, IPT and their counterpart in the control group.

H_A3: There is significant difference in achieving implantation among depressed infertile women taken through CBT, IPT and their counterpart in the control group.

One purpose of research Hypothesis three was to find out whether significant difference exists in the post-test implantation mean scores of infertile women exposed to CBT and those in the control group. This means the researcher wanted to find out if more depressed infertile women who received CBT would become pregnant than those who did not receive any therapy. Another purpose of research hypothesis three was to find out whether significant difference exists in the implantation mean scores of infertile women exposed to IPT and those in the control group at post-test. Here also, the researcher wanted to find out if implantation in the IPT group would be higher than those who did not receive any

therapy. Finally, hypothesis three was to find out whether significant difference exists in the implantation mean scores of infertile women exposed to CBT and their counterparts in the IPT at post-test. The objective of this was to see which of the two therapies was more effective in helping the depressed infertile women achieve higher implantation.

This hypothesis was tested using One-Way Analysis of Variance (ANOVA). There were three independent groups (CBT, IPT, and Control) and the dependent variable was post-test implantation scores. The one-way ANOVA was performed at a significance threshold of .05, and the results are indicated in Tables 18 and 19.

The results of the descriptive statistics for the different groups are shown in Table 16.

Table 16 – Implantation Descriptive Statistics

Group	N	Mean	Std. Deviation
CBT	15	1.47	.516
IPT	15	1.27	.458
CONTROL	15	1.13	.352
Total	45	1.29	.458

From Table 16, it can be seen that the mean score of the respondents in the CBT group was 1.47 which was the highest compared to the rest of the groups. However, the respondents in the Control group had the lowest mean score of 1.13. The implication of the results is that there are differences in the mean scores of the various groups.

The results of the ANOVA test are presented in Table 17.

Table 17 - ANOVA Comparing Post-Test Implantation Success of CBT, IPT and Control Groups

	Sum of Squares	df	Mean Squares	F	Sig.
Between Groups	.844	2	.422	2.111	.013
Within Groups	8.400	42	.200		
Total	9.244	44			

From Table 17, it can be seen that there is a significant difference in the post-test depression scores of participants on the basis of their groups [$F_{(2, 42)}$ = 2.111, p<.05]. The p-value of 0.013 is less than the .05 significant level. This means that there was a statistically significant difference in the mean scores of the three groups (CBT, IPT and Control). Since a significant difference was found, post-hoc test was conducted. Tukey's Post-Hoc test was conducted and the results are shown in Table 18.

Table 18 – Implantation Multiple Comparisons

Dependent Variable: Implantation Success
Tukey HSD

					95% Confidence Interval	
(I) GROUP	(J) GROUP	Mean Difference (I-J)	Std. Error	Sig.	Lower Bound	Upper Bound
CBT	IPT	.333	.163	.115	-.06	.73
	CONTROL	.200*	.163	.040	-.20	.60
IPT	CBT	-.333	.163	.115	-.73	.06
	CONTROL	.133	.163	.695	-.26	.53
CONTROL	CBT	-.200*	.163	.040	-.60	.20
	IPT	-.133	.163	.695	-.53	.26

*. The mean difference is significant at the 0.05 level.

From Table 18, it is observed that a significant difference exists between the participants in the CBT group and those in the Control group (p=.040). Aside

this, no significant difference was observed between the participants in the CBT group and the IPT group (p=.115) as well as the participants in the IPT and the control group (p=.695). This means that the mean scores of the participants who were in the CBT group was different from those in the Control group. Specifically, the mean score of the CBT group was higher than those in the Control group. This means that those in the CBT group had higher implantation success than those who were in the other groups.

Also, the results in Tables 17 and 18 show that though there is a difference in the implantation mean scores of infertile women exposed to IPT and those in the control group at post-test, the difference is not significant. This means that implantations in women in the two groups did not differ significantly.

Finally, the results in Tables 17 and 18 show that though there is a difference in the implantation mean scores of infertile women exposed to CBT and those in the IPT at post-test, the difference is not significant. This means that CBT is not superior to IPT when it comes to implantation in depressed infertile women.

Research Hypothesis 4

$H_0$4: There is no relationship between depression levels and achieving implantation among infertile women.

H_A4: There is relationship between depression levels and achieving implantation among infertile women.

This hypothesis was tested using logistic regression. The dependent variable was categorical (implantation) while the independent variable was continuous (depression scores). The results are presented in Tables 19 and 20

Table 19 - Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	19.359[a]	.087	.116

From Table 19, it can be seen that the model explained only 11.6% (Nagelkerke R2) of the variance in the dependent variable.

The test of whether depression scores of the various groups and implantation success are related significantly is shown in Table 20.

Table 20 - Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1[a]	CBT	.100	.134	.561	1	.045	1.105
	IPT	.150	.138	.131	1	.180	1.051
	CONTROL	.066	.111	.353	1	.153	1.068
	Constant	-2.945	2.674	1.213	1	.271	.053

a. Variable(s) entered on step 1: CBT, IPT, CONTROL.

From Table 20, it can be seen that post-test depression score of the CBT group was significantly related to implantation success among infertile women [$\chi 2(1) = .561$, $p<.05$]. This means that the relationship between depression levels of the participants in the CBT group and implantation success was significant. As a result, it can be said that being in the CBT group predicted implantation success. However, no significant relationship was observed between the depression scores of those in the IPT group and implantation success [$\chi 2(1) = .131$, $p>.05$] as well as for those in the control group [$\chi 2(1) = .353$, $p>.05$].

Discussion of Results

The discussion of the results is broadly done in four areas as stated below considering all the pre-test and post-test results:

1. Depression among Infertile women.
2. Differences between Pre-test and Post-test Depression Mean Scores of Infertile Women Subjected to CBT, IPT and Control groups.
3. Influence of Demographic Characteristics on the Depression Mean Scores of Infertile Women.
    a. Age and Infertility in Women
    b. Length of Marriage and Infertility in Women
    c. Educational Attainment and Infertility in Women
4. Differences between the Mean Scores of Depressed Infertile Women subjected to CBT, IPT and those in the Control Groups for Post-test Implantation.

Depression Among Infertile Women

It was discovered that infertile women suffer from depression. Fifty-eight percent (58%) of the infertile women from the 37 Military Hospital, the hospital used for the research, were depressed. This was in line with the findings of Alhassan, Ziblim and Muntaka (2014) who stated that as a result of social stigmatisation, women experiencing infertility in Ghana face psychological upsets, disorders and depression which prevalence among women they reported to be 62.0%. They showed that women with primary infertility had high BDI scores, which indicated that they were depressed. The findings are also in line with those

of Naab et al., (2013) who showed that anxiety and depression are real in infertile women in Ghana. The results of the study also confirm what was found by Chen T-H, et al (2004), who discovered that 40.2 percent of women planning for a new round of Assisted Reproduction treatment had psychiatric issues. Again, the conclusions of this investigation were similar to those of Noorbala et al. (2008). They conducted a research in Iran and showed that in 48% of women, depression was initially detected.

The current researcher suspects that the fact that the studies of Naab et al., (2013) and Alhassan, Ziblim and Muntaka (2014) as well as the current one occurred in the same cultural milieu with similarities in culture and other characteristics was the cause of the similarity in the findings of the studies.

Differences between Pre-test and Post-test Depression Mean Scores of Infertile Women Subjected to CBT, IPT and those in the Control Groups.

Both CBT and IPT were observed to reduce depression among infertile women compared to their counterparts in the control group who did not get any therapy.

The finding supports the assertions of Tarabusi, Volpe and Facchinetti (2004) who conducted a research to determine if cognitive behavioural group therapy could lead to a reduction in psychological distress in couples awaiting assisted reproduction and found a substantial decrease in the total value of Psychological Distress (SRT) in females in the CBT sample. Similarly, in this study, the pre-test mean score of 17.40 (*SD*=4.72) for infertile women in the CBT group reduced to 10.07 (*SD*=4.38) at post-test while the pre-test mean score of

18.07 (*SD*=4.73) for infertile women in the IPT group reduced to 13.27 (*SD*=4.40) at the post-test stage.

The findings also do not depart from the works of Hughes and Silva (2011), Faramarzi, Alipour, Esmaelzadeh, Kheirkhah, Hjiahmad and Rahnama (2008), Nilforooshan, Abedi, Ahmadi, Reza, Mohammad and Mahdi (2006), Mcnaughton (2002), Zyl (2005), Domar et al. (1990) and Facchinetti (2004).

Hughes and Silva (2011) assessed sub-fertile women using BDI-II and had their scores falling from 19.8(11.0) to 12.5 (10.2, *p*=.01) and Faramarzi, Kheirkhah, Esmaelzadeh, Alipour, Hjiahmad and Rahnama (2008), in Iran, also used BDI-II instrument and had a reduction in the mean score of depression from 7.7+/-4.2 to 3.6 +/- 2.7 after. They discovered that while both Fluoxetine medication and CBT considerably reduced the experimental group's mean BDI scores compared to the control group, the CBT group's decline was much greater than the fluoxetine group. They asserted that group CBT and other forms of psychotherapy were superior to or at least as effective as medication in treating depressed infertile women. Also in Iran, Nilforooshan, Ahmadi, Abedi, Mohammad Reza and Mahdi (2006) conducted a study to determine the impact of CBT on the depression of infertile couples based on the interacting approach of cognitive subsystems. The study model used was a quasi-experimental one. The results showed that therapy based on interacting cognitive subsystems is effective in the reduction of depression in the study group of infertile couples relative to the control group ($p<.0001$) and has a substantially higher impact on women than men. These studies are not contradicted by the findings of this investigation.

Mcnaughton (2002) performed a study on the effectiveness of short pair support groups to handle the tension of IVF treatment using CBT strategies. It was revealed, after IVF therapy, that women who attended group sessions were substantially less nervous than they were before the cycle (p<.001). Again in South Africa, Zyl (2005) conducted a study to assess if patients receiving support therapy would be better prepared with successful coping strategies than patients who were not given counselling. The findings revealed a modified pattern of conduct within the support therapy community which, after the counselling intervention, experienced a statistically significant (p<.017) reduction in depression levels. Also, the research by Domar et al. (1990) found that the 54 infertile women who completed the program of CBT along with relaxation response showed statistically significant reductions in depression, anxiety and exhaustion as well as increases in vigor. A research conducted in Italy by Facchinetti (2004) showed that CBT substantially decreased the heart rate (HR) response to Stroop CW. All these studies are supported by the findings of this study.

Again the findings of this study support the works of Koszycki et. al., (2012) who looked at the effectiveness and preliminary efficacy of IPT, the evidence-based antidepressant technique with the most peripartum research support, as a treatment for depressed women who were having fertility issues for the first time and had a higher response rate than BSP, with over two-thirds of women experiencing a >50% decrease in Montgomery–Sberg Depression Rating Scale ratings (MADRS). In the research conducted by Noorbala et al. (2008), the population mentally treated until they received infertility care had the Mean/*SD* Beck scores decline. Myrna

Weissman meticulously researched the use of IPT in adult depression with other researchers and showed that IPT was successful in reducing depressive symptoms both before and after the course of treatment (Dowrick et al., 2000; Hollon et al., 2002; Frank, 1991). In the work of Klier et al., 2001 who evaluated postpartum depression in women in an open-trial pilot of group-format IPT in Vienna, Austria, they concluded that the majority of women who completed the therapy experienced a substantial reduction in depressive symptoms, implying that a group IPT approach to treating postpartum depression may be effective. The findings of this study support all those stated above.

Finally, the findings of this study are in line with studies by Mulcahy et al., (2010); Neugebauer et al., (2006); Bass et al., (2006); O'Hara et al., (2000) and Margaret et al., (2003).

Mulcahy et al (2010) compared the results of an eight-week IPT group in connection with postnatal depression and 'treatment as usual' (TAU) and found out that for depression mean scores, the women in the IPT group improved slightly more after treatment. Similarly, in an open study, Neugebauer et al., (2006) looked into whether miscarrying women who received one to six weekly sessions of manualised, telephone-administered interpersonal counselling (IPC), a variant of IPT, experienced significant reductions in depressive symptoms and reported that IPC appears to reduce depressive symptoms after miscarriage. Also in a randomised controlled study comparing group IPT to standard care in rural Ugandans who meet the symptom and functional disability requirements for MDD or sub-threshold disorder by Bass et al., (2006), the report was that at 6 months, IPT-G, participants

had mean depression symptom and functional disability ratings that were 14.0 points and 5.0 points lower than the control group, respectively. Similarly, the treatment arm's incidence of major depression (11.7 percent) was substantially lower than the control arm's (54.9 percent; $p < .0001$). In the study by O'Hara et al., (2000) who determined the effectiveness of psychotherapy for postpartum depression women receiving IPT, the women in the IPT group saw their Hamilton Rating Scale for Depression (HRSD) scores drop, a substantial decrease compared to the control community. Similarly in this study, the mean BDI score of women treated under IPT decreased from 18.07 to 13.27 in comparison with the control group. In a 16-week bilingual randomised clinical trial by Margaret et al., (2003), a group of women receiving IPT for antepartum depression was compared to a control group of women receiving parenting education. Depressed mood was assessed using three scales including BDI. On all three mood tests, the IPT treatment group outperformed the parenting education control group. The findings of this study support all the various studies stated above.

The findings obtained in this study, however, depart from those of Lespérance et al., (2007) when it comes to IPT. Lespérance et al., (2007) used a factorial design to assess a 12-week effectiveness of both a psychotherapeutic and a pharmacologic treatment in patients with coronary artery disease (CAD) who were undergoing a major depressive episode. The aim of the study was to see how effective citalopram (an antidepressant) and IPT is at reducing depressive symptoms in patients with major depression and CAD in the short term. The study found no evidence that IPT was superior to clinical management. This study,

however, resulted in a significant reduction in the depressive levels of the infertile women involved in the IPT.

Therefore, the findings made in this study support the assertions of all the studies stated above with the exception of one study. It is clear that both CBT and IPT help in reducing depressive symptoms in infertile women though it appears from my results that CBT is more effective.

The current researcher suspects similarities in methodology and sample sizes might have caused the similarity in the findings of the studies except that of Lespérance et al., (2007) as stated above. For instance, Tarabusi, Volpe and Facchinetti (2004) used a sample size of 50; Ahmadi, Abedi, Mohammad Reza and Mahdi (2006) used 30 infertile couples while Domar et al. (1990) used a sample size of 54 infertile women. This study employed 45 infertile women which does not significantly differ from the sample sizes in the stated studies. With regards to the study of Lespérance et al., (2007) which this study departs from, the researcher believes that the contradiction is as a result of the methodologies used in the two studies.

Influence of Demographic Characteristics on the Depression Mean Scores of Infertile Women.

Age and Infertility in Women

This study did not find any evidence to support the assertion that depression levels among infertile women differ across ages since the depression levels among the study participants were similar across all ages. This contradicts the study of Lion (2002) who stated that anxiety and depression in infertile women are greater

as age increases. The mean depression score stratified by the age of the respondents was examined in Ghana in a study by Alhassan et al. (2014). They reported that depression levels exhibited a significant positive association with the women's age and infertility duration. Depression was found to be more prevalent in women over the age of 26 years and to be extremely important in women over the age of 35 years (p<.001). Until the age of 40 years, the mean depression score was higher at a higher age and remained stable afterwards. In their study, Mohammad and Ghodrati (2018) found that the rate of depression decreased with age in females. In fact, there was an inverse relationship between the age of the females studied and their prevalence and severity of depression. The researcher's study departs from the works of Alhassan et al. (2014) and Mohammad and Ghodrati (2018).

In Ogbomoso, Southwest Nigeria, the study of Oladeji and OlaOlorun (2017) found a depression prevalence of 52.7 percent among infertile women. However, the age group of respondents, their degree of education, years after marriage, form of infertility, and depression were not significantly related. The researcher's study supports this assertion since it did not find any significant difference among the depressive levels of the infertile women across all ages.

The contradictions between this study and those of Lion (2002), Alhassan et al. (2014) and Mohammad and Ghodrati (2018) may be as a result of possibilities of differences in age ranges used in the studies. The current researcher used the fertility levels of women to determine the age ranges and therefore had unequal range among the sub groupings. The age ranges in the previous studies differed significantly from those of the current study. With regards to the study of Oladeji

and OlaOlorun (2017), which the findings in the current study support, years of the studies which are not too far apart could be used as the possible reason for the similarities.

Length of Marriage and Infertility in Women

This study did not find any significance difference between the duration of marriage and depressive levels of infertile women and this departs from the research conducted by Domar, Broome, Zuttermeister, Seibel, and Friedman (1992) who stated that depression peaks between the 2nd and 3rd years of infertility and returns not to the normal range until after an infertility period of six years.

Also, the findings in this study do not support those of Khademi et al (2008), Domar, Seibel and Benson (1990), Shakhar (2009) and Wirtberg, Miller, Hogstrhm, Tronstad and Lalos (2007). For instance, Khademi et al (2008) found a positive correlation between duration of infertility and depression scores. Domar, Seibel and Benson (1990) found that depression increases with infertility period and with the lengthening of infertility time. Shakhar (2009) also believed that the longer infertility lasts, the more disastrous its effect would be. A research conducted in Sweden by Wirtberg, Miller, Hogstrhm, Tronstad and Lalos (2007) revealed that at the time of the research, as the peer group of the women reached the grandparent stage, the effects of childlessness were particularly enhanced.

Ramezanzadeh et al (2004) claim that psychological interventions, particularly in the first four to nine years of infertility may prevent an increase in depression and, thus, increase pregnancy rates. These claims suggest that lengthier marriages result in an increase in psychological disorders, such as depression,

among infertile women. On the contrary, this study found that the length of marriage has no statistically significant effect on the pre-test depression mean scores of infertile women. This suggests that infertile women in Ghana, regardless of how long they have been married, suffer from equal levels of despair.

The possibilities of differences in years of the studies may be the possible causes of the non-similarities that exist. The earliest year of the studies cited is 2009 which is 13 years earlier than the current study.

Educational Attainment and Infertility in Women

This study's finding goes contrary to the research by Lion (2002) who stated that anxiety and depression in infertile women is greater by getting diploma training or less. Parveen (2008) carried out a study to examine Pakistan's psychosocial adjustment of uneducated and educated infertile females. The results showed a substantial difference between educated and uneducated infertile women's psychosocial adjustment. Parveen's study is not supported by this study. Again, depression was shown to be considerably greater among those with little or no formal education in Ghana in the study by Alhassan et al. (2014) but this was not corroborated in this study. This study suggests that infertile women, regardless of their educational qualification, had similar levels of depression.

It is the guess of the current researcher that the discrepancies in the methodologies employed in the studies were responsible for the differences in findings observed here. For instance, Parveen (2008) had prerequisite conditions that the infertile women should have a minimum duration of marriage of three years without children and were under the treatment. This was not the case in this study.

Differences between the Mean Scores of Depressed Infertile Women subject to CBT, IPT and those in the Control Groups for Post-test Implantation.

Significant difference existed among depressed infertile women who were taken through CBT and their counterpart in the control group for post-test implantation. However, the difference between depressed infertile women who were taken through IPT and those in the control group for post-test implantation was not statistically significant. Also, the difference between the depressed infertile women who were taken through CBT and those who were taken through IPT for post-test implantation was not statistically significant.

It is not so clear what might have accounted for the reason for not achieving significant difference in the post-test implantation between depressed infertile women who were taken through IPT and their counterpart in the control group but significant difference was achieved in the post-test implantation between the depressed infertile women in the CBT and control groups. Since the significant difference in the depressive levels of the infertile women who experienced CBT and those in the control groups was greater than the significant difference that was achieved between the depressive levels of the infertile women who were taken through IPT and their counterpart in the control group, making CBT probably a superior therapy than IPT, (This probably means that CBT worked more on the infertile women than IPT) it might have shown at the post-test implantation stage also. Hence, the reason why depressed infertile women who experienced CBT achieved significantly higher implantation but same cannot be said of infertile women who were taken through IPT.

The results obtained from the CBT and the control groups confirm those from Terzioglu (2001) who conducted a research in Turkey to identify the efficacy of therapy on assisted reproductive techniques that revealed that couples in the experimental group had their depression and anxiety scores lowered than couples in the control group. For couples in the experimental group, pregnancy rates and life satisfaction scores were greater than for the pairs in the control group.

This study's results are also in line with those of Domar et al. (1990); Abedinia, Ramezanzadeh and Noorbala (2009); Domar et al. (2000); Newton et al., (1999) and Noorbala et al., (2007); Karlidere et al. (2008); and Gurhan, Akyuz, Atici and Kisa (2009). In the research by Domar et al. (1990) in which some infertile women who completed the program of CBT along with relaxation response, there was statistically significant reductions in depression, anxiety and exhaustion, 34 percent of the women achieved pregnancy within six months of completing the CBT.

The goal of Abedinia, Ramezanzadeh and Noorbala (2009) was to determine the factors influencing depression and the effects of psychological treatment on infertile couples' pregnancy rates. The participants in the case group received 6-8 psychotherapy sessions prior to infertility treatment and received 20-60 mg of Fluoxetin daily at the same time, and no intervention was given to the control group. In the group psychologically treated prior to receiving infertility treatment (p<.001), the mean scores dropped from 18.7 to 10.7. The pregnancy rate in the case group was 47.1 percent and the control group was 7.1 percent.

The effectiveness of CBT and standard support approaches on pregnancy rates in women with infertility lasting less than two years was studied by Domar et al. (2000). Data have shown that group psychological interventions in infertile women tend to contribute to increased pregnancy rates. The results of studies conducted by Newton et al., (1999) and Noorbala et al., (2007) show the influence of psychotherapy and psychological intervention on the rate of success of pregnancy and psychiatric disorders among infertile couples. The study showed that lower depression, higher rate of pregnancy and good rates of marital satisfaction were found in the intervention group.

A research by Karlidere et al. (2008) included 104 Turkish women who were predominantly infertile prior to their embryo transfer date. Low pregnancy rates were also predictive of the increased incidence of depressive symptoms and higher anxiety levels (Karlidere et al., 2008). Gurhan, Akyuz, Atici and Kisa (2009) showed in their study that with higher depression, low oocyte numbers were associated. Women with a high level of state anxiety had substantially lower pregnancy rates on the oocyte pickup day, as did those with higher depression. All the above stated studies are corroborated by the findings of this study.

Also the results of this study do not depart from those obtained by Clapp, Domar, Slawsby, Dusek, Kessel and Freizinger (2000); Tuschen-Caffier, Florin, Krause and Pook (1999); Nilforooshan, Ahmadi, Abedi and Ahmad (2006); De Liz and Strauss' (2005) and Hammer (2009).

Clapp, Domar, Slawsby, Dusek, Kessel and Freizinger (2000) showed in their study that, compared with 20 percent of the controls, 55 percent of the CBT

and 54 percent of the participants in the support group had a viable pregnancy. The effect of a six-month CBT for infertile couples was assessed by Tuschen-Caffier, Florin, Krause and Pook (1999). The goal of the intervention was to increase the likelihood of reproduction, sexual functioning and fulfilment. The live birth rate was higher than in control samples in the therapy community.

Also, the effect of CBT on the pregnancy rate of couples with infertility was assessed by Nilforooshan, Ahmadi, Abedi and Ahmad (2006). The findings showed that pregnancy occurred in the experimental group in 33 (47.1 percent) couples and in the control group in just 5 (7.1 percent) couples. There was a substantial difference between the treatment and control groups in the pregnancy rate (p<.001). The findings (logistic regression analysis) showed that pregnancy was 14 times higher than that of the control group in the experimental group. Again, De Liz & Strauss' (2005) meta-analysis indicates that psychotherapy decreases depression for infertile women and likely increases the success of pregnancy. Psychological interventions that included educational interventions, counselling, CBT, psychodynamic/analytic were examined in another meta-analytical study by Hammer (2009). The findings show some proof of the effectiveness of psychological interventions in achieving pregnancy and show that they can be effective in increasing the rate of pregnancy for couples.

Finally, the results obtained from the IPT and control groups support those of Schmidt, Holstein, Christensen, and Boivin (2005), Clark et al. (1995) and Clark, Thorley, Tomlinson, Galletley and Norman (1998). However, the results from the CBT and control groups partially depart from them. Starting one month before the

participants' IVF periods, Schmidt, Holstein, Christensen, and Boivin (2005) tracked 166 women, and the out-turn showed no substantial association between psychological stress and the outcome of IVF. Review of the findings by Clark et al. (1995) and Clark, Thorley, Tomlinson, Galletley and Norman (1998) in their studies involving obese anovulatory women showed that CBT approaches were more effective than in altering interpersonal functioning but it was doubtful that pregnancy rates would be influenced by cognitive behaviour therapies.

The possible explanation for the similarities in implantation with previous studies under CBT may be due to similarities in methodologies and sample sizes. For the differences seen under IPT for post-test implantation, it may be because the researcher was relatively new to IPT and therefore the therapy might not have resulted in optimal change in the depression levels of the infertile women and hence the change in post-test implantation. The researcher had used CBT in an MPhil studies but that was the first time IPT was being used.

In conclusion, there exists depression among infertile women in Ghana and both CBT and IPT have been shown to help lower significantly such depressive levels in this research. Also in this study, it has been shown that demographic characteristics do not influence the depressive levels of women with infertility in Ghana. Finally, it was demonstrated in this study that significantly lower levels of depression within infertile women in Ghana as a result of CBT intervention could result in significantly higher implantation though same cannot be said of IPT intervention.

Counselling Implications of the Findings

The fact that infertile women feel depressed suggests that hospitals, particularly fertility centres, should hire mental health experts to help the women in dealing with their circumstances throughout their treatment. This can be done using CBT and IPT. Fifty-eight (58) percent of the respondents were found to be depressed by the scale. This means that it is extremely important that psychological inventories, particularly the Beck Depression Inventory, are used to assess infertile women's depression levels when they attend a hospital or reproductive clinic and select the affected persons for therapy, allowing for successful treatment. Those found to have higher depression levels after administering the inventory, which cannot be addressed through counselling, can be referred to a Psychiatrist or Clinical Psychologist for further action.

The findings that 37.8 percent of the respondents were from ages 18 to 35 years and 42.2 percent of the respondents were between the ages of 36-43 as well as 86.7 (51.1+35.6) percent of the respondents had been married for 20 years or less imply that couples and individuals seeking to have children should be given the necessary counselling so they can take the step of getting children earlier in their lives and marriages by seeking help from the appropriate health centres on time. This has the likelihood of increasing their chances of success with fertility treatments and reducing the possibility of relying on donor gametes.

The findings that 20 percent of the respondents were over 43 years and 13.3% of them had been married for more that 20 years imply that older infertile women seeking for children should be given the necessary counselling in order not

to lose hope in life since it was observed that beyond certain age some infertile women become fed up and therefore stop seeking healthcare. Such individuals can be introduced to other forms of having children for example adoption for consideration.

The findings that no significant difference exists between the ages of respondents and their depressive levels; no significant difference exists between marriage duration of respondents and their depressive levels and no significant difference exists between the educational qualification of infertile women and their depressive levels imply that equal attention should be given to infertile women in counselling irrespective of their ages, marriage duration and educational qualification.

The findings that high percentage of the infertile women (42.2 percent) had college education and hence could afford the cost of the fertility treatment since individuals with tertiary education are more likely to be from the middle to upper classes imply that the state should find means of subsidising the cost of fertility treatments in the country since such costs are not covered under the National Health Insurance and currently no public hospital does any of the major fertility treatments (IVF and ICSI) which made me employ the services of a private health centre, City of Hope Medical Complex for the IVF.

Again, medical workers who treat infertile women should provide them with the appropriate support. They should also avoid exacerbating the women's psychological state with obnoxious remarks and other behaviours.

The Ghana Health Services and the Ministry of Health should develop policies to control the activities of fertility clinics and to ensure that such clinics employ counsellors.

Again, counsellors should be aware about reproductive difficulties and give infertile women with pertinent information about their infertility as well as appropriate referrals as needed.

Furthermore, infertile women should be encouraged to create social groups to address their shared interests. These social groups can aid infertile women in sharing their feelings openly, as shown during the therapy sessions, and in dealing with any psychological issues they may have.

Finally, while depression is common among infertile women of all ages, counsellors should be made to play a key role in situations where third parties are involved in the treatment process, either by donating their gametes for the women or serving as surrogates for them, because these issues are common among older women and can compound the psychological state of infertile women.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Infertile women visiting the 37 Military Hospital in Accra were given the Beck Depression Inventory to determine their depression levels. Another goal of the trial was to see if CBT and IPT could help infertile women with their despair. In addition, the researcher wanted to see if factors including age, marriage length, and educational attainment were significant predictors of depression in infertile women. Also, the researcher wanted to find out if infertile women with the said demographic characteristics would react differently to the therapies (CBT and IPT). Finally, the researcher wanted to find out if a possible reduction in the depression levels of infertile women as a result of being taken through CBT and IPT could result in higher implantation among such women. The study employed the True-Experimental approach. The target population of the sample included all infertile women seeking care at the 37 Military Hospital while the accessible research population involved all infertile depressed women going to the 37 Military Hospital in the Greater Accra region from September 2021 to November 2021 for fertility care. The 37 Military Hospital provided a sample of 45 after the infertile women and their partners were screened for uniformity in their fertility levels among other things.

Beck's Depression Inventory was employed as a research tool. The ladies who took part in the study were chosen using a combination of purposive and

random assignment to the therapy groups. 15 each of the selected depressed infertile women were allocated to the CBT, IPT and Control groups respectively. Those in the CBT and IPT groups received therapies for 12 sessions each spanning six weeks while participants in the control group received no therapy at all. The depression levels of all the 45 women were taken again two weeks after the therapies to see whether the therapies had a positive impact on those in the experimental groups as against those in the control group. Finally, all the 45 women were made to undergo fertility treatment (IVF) at City of Hope Medical Complex after which their implantation levels were assessed.

Summary

The data was analysed using two-way ANOVA as well as one-way ANOVA and logistic regression. The following results were obtained:

1. There is a substantial difference between the pre-test and post-test mean depression scores of infertile women who received CBT, according to the study.
2. The post-test depression mean scores of infertile women who received CBT and those in the control group varied significantly.
3. There is a substantial difference between the pre-test and post-test mean depression scores of infertile women who received IPT, according to the study.
4. The post-test depression mean scores of infertile women who received IPT and those in the control group differ significantly.

5. Demographic characteristics (age, marriage length, and educational attainment) have no effect on the depression mean scores of infertile women in the experimental and control groups at the pre-test stage.
6. Demographic characteristics have no effect on the depression mean scores of infertile women in the CBT group at post-test.
7. Demographic characteristics have no effect on the depression mean scores of infertile women in the IPT group at post-test.
8. There is significant difference between the mean scores of infertile women subject to CBT and those in the control group for post-test implantation.
9. There is no significant difference between the mean scores of infertile women subject to IPT and those in the control group for post-test implantation.
10. There is no significant difference arising out of implantation mean scores of women with infertility taken through CBT and their counterpart in the IPT group at post-test.

Conclusions

From the research, the following conclusions can be inferred:

Some infertile women attending the 37 Military Hospital in the Greater Accra Region suffer from depression. Secondly, for infertile women who are depressed, CBT and IPT are effective in reducing the depression levels in such women.

Also, during pre-test, infertile women's age, length of marriage, and educational levels have no significant influence on depression. In other words, CBT

and IPT work similarly in infertile women whether they have advanced in age or not; whether they have been married for long or not and whether they have attained higher education or not.

Finally, a reduction in the depression levels of infertile women who are taken through CBT could result in higher implantation but same cannot be said of depressed infertile women who are given IPT even though their depression levels could come down with the therapy.

Observed/Final Model

From the findings of this study therefore, the following observed/final framework was generated:

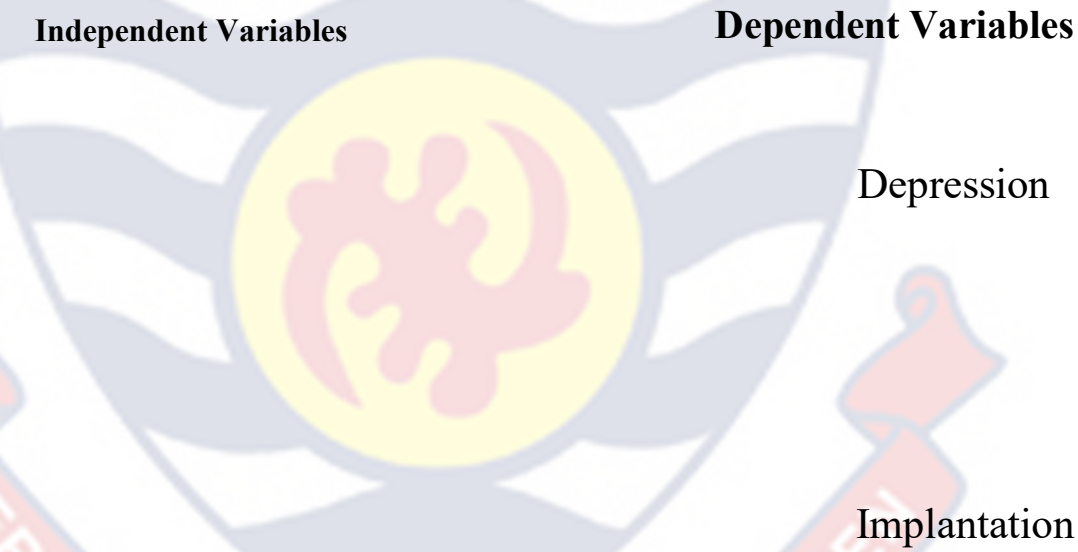

Figure 8: Observed/Final Framework
Source: Author's construct

The research established that both CBT and IPT are effective in reducing infertility-related depression. The research further established that the positive

effect CBT has on the depression levels of infertile women would lead to an increase in implantation. However, demographic variables (age, period of marriage and educational qualification) have been found not to predict the depression levels of infertile women in this study.

Recommendations

The following recommendations are made in light of the facts and conclusions stated above:

1. Counsellors, psychologists, family life educators, etc. should employ CBT and IPT to help infertile women manage their depression. Counsellors should be very knowledgeable in CBT and IPT in order to help infertile women deal with their situation. Managers of health facilities especially fertility centres should ensure that Counsellors they employ have adequate training in CBT and IPT and also help them update their knowledge always through continuous professional development (CPD). Counsellors should make use of the therapy (CBT or IPT) they are very conversant with and which works well for them.
2. Counselling should play a vital role in fertility treatments, and counsellors should be a part of the team at every fertility centre, as well as all hospitals and clinics in the country that provide fertility services. At the start of their quest to have a child, the depression levels of infertile women should be assessed by Counsellors even before they begin the medical examinations to determine the causes of their infertility. This is because the researcher observed that most of the infertile women who attended the hospital for

fertility care had already done a lot to themselves in terms of seeking for a child and so tended to be extremely worried about their situation and also get confused as to the subsequent steps of the treatment ladder which has the tendency of aggravating their depressive levels. Therefore, assessing the depressive levels of infertile women at the onset of their fertility journey will help calm them down and forestall any confusion in their minds. This in the end will probably help them achieve the needed result of having a child.

3. **Post-treatment Counselling:** Counsellors should ensure that counselling does not end at the initial stages of the treatment ladder of infertile women. Follow-up counselling during and especially after fertility treatments is very essential. As was observed in the study, not all the women got pregnant from the IVF and such outcome can have very devastating effects on their emotional and psychological states if left unattended to by Counsellors. It is therefore expedient that Counsellors give post-treatment counselling to infertile women who are unsuccessful in fertility treatments. Even for those who succeed in getting pregnant from fertility treatments some counselling will still be needed to help such women come to terms with their present condition and how to manage it well.
4. **Fertility Counselling:** Counsellors who are placed in health institutions should be given the needed training in medical terminologies with regards to fertility/infertility and issues relating to people living with infertility. This will prevent counsellors from fumbling when they engage people living

with infertility especially infertile women. Counselling centres of educational institutions should take the necessary steps to incorporate some aspects of fertility counselling in their curricula to help address infertility holistically in the country.

5. **Instrument Use:** BDI-II could be administered to infertile women when they attend health centres for fertility care and those found to be depressed by the scale helped with any of the therapies. Counsellors should be very conversant with the use of BDI-II for effective outcomes. Ambiguous words should be well explained to infertile women at the point of administering them. Counsellors should adapt the BDI-II to suit their needs as and when it becomes necessary without loosing its main focus.
6. Counselling services should be included in policies and laws that govern fertility treatments and activities in Ghana. The Ministry of Health, Ghana Health Services and other stakeholders should ensure that this is done. Stakeholder meetings should be organised by the Ministry of Health to solicit views on laws/policies that will govern fertility treatments and the operations of fertility centres in the country and such views collated to form the basis of an appropriate law/policy.
7. **Para-Professionals:** The researcher observed that a significant number of the infertile women delayed in seeking help from the appropriate quarters, especially the hospitals, because of the involvement of religious leaders in particular. When the Counselling Association of Ghana is born at last, it can collaborate with the already existing Ghana Psychology Council to engage

such paraprofessionals and when necessary give them the appropriate training in fertility counselling in order to help people living with infertility, especially infertile women.

The Researcher's Contributions

The researcher has contributed in various ways with his study as highlighted below:

- **Methodology:** The two counselling approaches (CBT and IPT) combined to solve an issue in Ghana by the researcher is novel. Again, IPT as a counselling approach is not known to have ever been used in Ghana but the researcher used it. The fact that the area the researcher studied related to a personal highly confidential one but was successfully executed by the researcher is novel. Also, the method of collecting some of the data used for the study which involved going into folders of patients (infertile couples in this case) as well as getting the implantation data to address counselling needs is unique. Finally, the integration of medical treatment (In Vitro Fertilisation) with counselling using the case of the participants to address the needs of individuals is novel.
- **Literature and Knowledge:** The study has shown that both Cognitive Behavioural Therapy and Interpersonal Psychotherapy work. The study demonstrated that some infertile couples are confronted with infertility and the application of either CBT or IPT could help such infertile women have a reduction in their depressive levels. It has also come to knowledge through the researcher's work that the application of CBT to help infertile women who are depressed could result in higher implantation.

Lastly, the researcher demonstrated that demographic variables do not predict the depression levels of infertile women contrary to previous knowledge.

- **Policy:** Through the researcher's work, policy makers will now see the need to integrate counselling in health policies to help address infertility cases holistically. It came to the attention of the researcher that fertility centres keep springing out across the country and that the law to regulate the industry is now being worked on. It is, therefore, important that any such law took into account fertility counselling. Also, the Ghana Education Service will now see the need to amend the curricular to include fertility counselling on the account of the researcher's work.
- **Practice:** Counsellors, health workers, psychologists, family life educators, social workers, etc. will now see the need, on the account of the researcher's work, to collaborate to help infertile women. Couples with infertility especially the women now see the need to seek counselling since that is capable of helping them to get pregnant.

Suggestions for Further Research

Infertile women's depression levels in other parts of Ghana should be investigated. This can be determined using Beck's Depression Inventory. The researcher conducted his study in the Greater Accra Region of Ghana. Even though some of the participants in the study came from outside Greater Accra Region, it will be interesting to investigate the depression levels of infertile women who attend hospitals in the other fourteen regions of Ghana to have a broader perspective. Are there peculiar issues especially in hospitals in the Greater Accra Region that make infertile women more depressed? Are staff of hospitals in the

Greater Accra Region less receptive than staff of hospitals in the other regions that impact on the depression levels of infertile women? These and many more questions can be answered if the research is replicated in the other regions of Ghana. Master's and PhD students as well as other researchers including state institutions can take up this challenge.

Also, the effectiveness of CBT and IPT on depressed infertile women and their implantation levels in the other regions of Ghana should be explored. Even though the difference between the pre-test and post-test scores of the women who experienced CBT was larger than the difference in the pre-test and post-test scores of those who experienced IPT, the overall difference between those who experienced CBT and IPT was not significant. Studies in the other regions of Ghana could probably unearth this.

Furthermore, a longitudinal study should be carried out to go beyond implantation and look at depressed infertile women who will have viable pregnancies after being taken through therapies and those who will go on to have healthy babies. After women have successfully achieved implantation or recorded positive pregnancy test through IVF, a scan is conducted on them usually two weeks after to determine those who will achieve a viable pregnancy, rule out ectopic pregnancy among other things. A longitudinal study should be done to go into these and to follow the women up through nine months of the pregnancy to determine those who will have heathy babies in the end. The said study can also be used to determine those who will have miscarriages during the pregnancies, those who will have stillbirths, those who will have premature deliveries, etc.

Finally, a study can be conducted to compare the pregnancy outcomes of infertile women in Ghana who have low depression levels as against those who have high depression levels. Depression levels of infertile women who achieve pregnancy should be assessed at the start of the pregnancy and the women followed through to the end to determine the outcome of such pregnancies. Will women who are more depressed have miscarriages when pregnant? Are women who are less depressed more likely to have healthy babies than their counterparts who are more depressed? These and many more questions can be answered in such a study.

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APPENDICES

APPENDIX A

BECK'S DEPRESSION INVENTORY

Depression is a common psychological problem that has been found among women confronted with infertility over the years. This instrument is designed to obtain information from women facing infertility in Ghana. The research is strictly an academic exercise. Your participation is important because you will be contributing immensely to the realization of the objectives of the research. Please carefully read the questions and provide thoughtful responses by ticking (√) the appropriate option that reflects your thoughts.

SECTION A: BACKGROUND INFORMATION

1. Age: 18 – 35 years [ ]

   36 – 43 years [ ]

   Over 43 years [ ]

2. How long have you been married?

   1 – 10 years [ ]

   11 – 20 years [ ]

   More than 20 years. [ ]

3. Educational Level: None [ ]
   JHS [ ]
   SHS [ ]
   Tertiary [ ]

SECTION B: BECK'S DEPRESSION INVENTORY (BDI)

Please carefully read the statements below and tick (√) one box out of the four options on each of the 21 items which describes your present condition. Confidentiality of the information you provide is very much assured

1.

[ ] Never in my life have I felt sad.
[ ] I occasionally experience sadness.
[ ] I'm sad throughout and I can't seem to escape it.
[ ] I can't stand how miserable and sad I am.

2.

[ ] I don't have a lot of reason to be unhappy with the future.
[ ] I don't like how I feel about what is ahead.
[ ] I sense that there is nothing to look forward to.
[ ] I believe that things will not improve in the near future.

3.

[ ] I no longer feel like a loser
[ ] I believe I've failed more often than the typical person
[ ] What I can see is a lot of failures when I look back on my past..
[ ] As a human, I feel I'm a total failure..

4.

[ ] I get as much gratification from things as I used to do..
[ ] I don't like things the way I used to.
[ ] I no longer get true pleasure out of something.
[ ] I am board or frustrated with everything.

5.

[ ] I'm not feeling particularly guilty.
[ ] A decent portion of the time, I feel guilty.
[ ] Much of the time, I feel very guilty.
[ ] All the time, I feel guilty.

6.

[ ] I have no impression that I'm being punished.
[ ] I fear that maybe I will be punished.
[ ] I hope to receive punishment.
[ ] I fear like I'm being punished.

7.

[ ] In myself, I do not feel let down.
[ ] I'm self-downhearted.
[ ] I am self-disgusted.
[ ] I dislike myself.

8.

[ ] I have no impression that I am any weaker than anyone else.
[ ] I am critical of myself because of my faults or errors.
[ ] I blame myself for my mistakes all the time.
[ ] For all the negative things that happen, I blame myself.

9.

[ ] I have no intentions whatsoever of killing myself.
[ ] I have ideas of killing myself, but I'm not going to carry it out.
[ ] I'd like to see myself dead.
[ ] If I had the choice, I would kill myself.

10.

[ ] I don't weep more than normal anymore.
[ ] Now I'm crying more than I used to.
[ ] Now I weep all the time.
[ ] I used to be able to weep, but even though I want to, I can't cry now.

11.

[ ] I am no more annoyed by things than I have ever been.
[ ] Now I'm a bit more annoyed than usual.
[ ] A good deal of the time, I am very frustrated or irritated.
[ ] All the time, I feel frustrated.

12.

[ ] I did not lose interest in other persons.
[ ] I'm less interested than I used to be in other individuals.
[ ] I've lost much of my trust in other individuals.
[ ] I've lost all of my trust in other individuals.

13.

[ ] I make choices as well as I've ever been able to.
[ ] Rather than I used to, I put off making choices.
[ ] I have more trouble making decisions than I used to have.
[ ] I can no longer make choices at all.

14.

[ ] I don't believe I'm looking any worse than I used to look.
[ ] I'm concerned about the fact that I look old or unattractive.
[ ] I feel my appearance is constantly shifting, making me look unattractive.
[ ] I believe I'm looking ugly.

15.

[ ] I can work through it as well as before.
[ ] To get started with something takes an extra effort.
[ ] To do something, I have to drive myself really hard.
[ ] I can't do any job whatsoever.

16.

[ ] I can get as good as normal sleep.
[ ] I don't get as much sleep as I used to.
[ ] 1-2 hours earlier than normal, I wake up and find it difficult to get back to sleep.
[ ] I wake up a couple of hours earlier than I used to, and I can't sleep again.

17.

[ ] I don't get tired any more than normal.
[ ] More quickly, I get tired than I used to.
[ ] I get bored of doing virtually everything.
[ ] I'm too exhausted to get anything done.

18.

[ ] My cravings are no worse than normal.
[ ] My appetite isn't as good as it once was..
[ ] Now, my appetite is getting worse..
[ ] I no longer have any appetite at all.

19.

[ ] I haven't lost a lot, if any, of weight lately.
[ ] I've lost over five pounds.
[ ] I've lost over ten pounds.
[ ] I've lost over fifteen pounds.

20.

[ ] I am no more concerned than normal about my health.
[ ]I'm concerned about aches, headaches, upset stomach, or constipation being physical issues.
[ ] I'm really concerned about physical issues, and a lot more is hard to think about.
[ ] I am so concerned about my physical issues that there is nothing else I can think of.

21.

[ ] No recent shift in my interest in sex has been observed by me.
[ ] I'm less interested than I used to be in sex.
[ ] I have virtually no interest in sex.
[ ] I have absolutely lost interest in sex.

APPENDIX B

MEASURING IMPLANTATION

Please provide the medical results of the following tests. Please tick (√) the appropriate option where boxes are provided.

1. **Test(s) undertaken by women:**

Transvaginal Scan [ ]

Uterus…….

Endometrium……..

Ovaries……

HSG [……]

Hormones [ ]

FSH……

LH……..

AMH……..

Estradiol…….

Progesterone……

Prolactin…….

2. **Male partner's test(s) undertaken:**

Semen parameters [ ]

Count……..

Motility…..……

Morphology...……

3. **BMI:** Weight…….. Height……

4. **Number of embryos transferred** [……..]

5. **hCG positive?** Yes [ ] No [ ]

APPENDIX C

TREATMENT PLAN - CBT

Pre-counselling phase

The researcher administered the BDI-II to the participants in order to collect the base line data. After this, the participants whose depression scores were high on the BDI as explained in the text were grouped into two experimental (CBT & IPT) and control groups. CBT and IPT groups were taken through counselling and the control group did not receive any counselling.

Counselling phase - CBT

A total of twelve (12) counselling sessions (twice in a week, for six consecutive weeks) were held. Each session lasted for about 60 minutes.

Session 1: **Establishment of relationship**

Objectives:

I. clients get to familiarize themselves and also to be aware about the goals for the counselling session

II. outline counsellor's and clients' roles

III. assist participants to come out with their expected goals

IV. set rules and regulations for the whole session and choose leaders.

Activities:

In this session, clients introduced themselves as well as the counsellor, the treatment goals were stated and the expected roles of the counsellor as well as the clients were discussed. Leaders were chosen and rules and regulations which govern the sessions were set.

Session 2: **Nature of Infertility & its Psychological Consequences**

Objectives:

I. Discuss the nature of infertility with clients.

II. Discuss causes of male and female infertility with clients

III. assist participants to come out with some psychological problems associated with infertility, narrowing the discussion to anxiety and depression

Activities:

In this session, clients were led to come out with the nature of infertility, its causes and psychological consequences. Question and answer format was mainly employed at this stage.

Session 3: Depression and its related issues

Objectives:

I. explain the term "depression"

II. outline at least five causes of depression

III. enumerate at least six symptoms of depression

IV. discuss at most four effects of depression.

Activities:

This sessions will cover the explanation of depression, its causes, symptoms and effects.

Definition of depression	Causes of depression	Symptoms of depression	Effects of depression
Depression refers to the feelings of severe despondency and dejection.	Genetics, biology (alterations in neurotransmitter levels), environmental and psychosocial factors are thought to be the main causes of depression. Risk factors include: events in life like divorce, medical concerns, chronic pain, etc.	i. Irregular happiness reduced enjoyment or interest in activities that once made a person happy. ii. ii. A decline in sex motivation. iii. iii. A reduced capacity for thought, concentration, or decision-making. iv. iv. Constant contemplation of suicide, attempted suicide, or death Feelings of worthlessness or guilt.	I. Loss of appetite, II. agitation, weight gain or loss, slowness in activity, agitation, excessive crying, irritability, social isolation.

Sessions 4-5: Nature of CBT, Layers of cognition and cognitive distortions

Objectives:

I. explain the acronym 'CBT'

II. discuss the Layers of cognition

III. identify at least three cognitive distortions

Activities:

In this section, the nature of CBT will be discussed. Role play will be used to explain the Layers of cognition and again cognitive distortions/errors about events, mostly infertility related, will be identified.

Nature of CBT	Layers of Cognition	Cognitive Distortions
CBT is founded on the idea that emotions, feelings, and behaviours are products of cognitive processes, which people may change or reorganise to produce other emotions and behaviours. In order to modify bad behaviours, it is a therapy procedure that helps people recognise and face their negative thought patterns and comprehend that they are unhelpful or disruptive.	**Schema (s)** are the mental structures used to process the information around us (self, others, world and future). **Core Beliefs** are beliefs individuals hold about themselves, others and the world. Eg. the infertility in my life is beyond repairs. **Intermediate Beliefs** are the rules and assumptions that we form out of core beliefs. Eg. If the infertility in my life is beyond repairs then there's no need for me to seek redress. **Automatic Thoughts** are thoughts that occur spontaneously without choice or efforts in response to situations or events. The beliefs individuals have about event cause them to have adaptive or maladaptive behaviours.	. Jumping to Conclusions: Seeing neighbours laugh is an indication that they are laughing at you for being infertile. 2. Disqualifyng the positive: rejecting positive experiences in your life by insisting they don't count so long as you are infertile. 3. The Fortune Teller: Seeing yourself that you'll never be successful with fertility treatment.

	Having positive beliefs about events will lead to positive consequence or adaptive behaviour. Having negative beliefs about events lead to maladaptive behaviours	

Session 6: **Thoughts and Mood**

Objective:

Discuss various thoughts that affect mood.

Activities:

In this session, clients will be led to come out with various thoughts particularly those relating to infertility that affect their mood. For example the thought of dying without a child or not having a biological child to inherit them. This session was also used extensively to discuss perceived stigma on infertility.

Session 7: **Behaviours and Mood**

Objective:

Discuss various behaviours that affect mood.

Activities:

In this session, clients will be led to come out with various behaviours particularly those relating to infertility and childlessness that affect their mood.

Session 8: **Mood and Significant Others**

Objective:

Discuss how interaction with others affect mood

Activities:

In this session, the focus will be on how participants' mood is influenced by their interaction with significant others in their lives. For example how perceived stigma on infertility by others affect their mood.

Session 9-10: Therapeutic techniques for changing maladaptive thoughts

Objectives:

I. Review clients' knowledge on cognitive restructuring

II. discuss ways by which clients can eliminate maladaptive thoughts so as to reduce if not eliminate psychological dysfunction.

Activities:

The clients will be educated on automatic thoughts and emotional, behavioural and physiological reactions. They will be exposed to the basic cognitive model. In the second phase, they will be asked to identify and modify core and intermediate beliefs. During this stage, empiricism and guided discovery methods e.g. Socratic questioning will be employed. By the end of the second phase, the clients will be able to acquire adaptive or functional thinking.

Session 11: **Goal Setting**

Objective:

Discuss goal setting and how to set individual goals

Activities:

In this session, clients will be assisted to set goals by making their own strategy for managing depression.

Session 12: Review of past sessions and Termination

Objectives:

I. reiterate all the previous sessions

II. elucidate all unresolved issues

III. appraise the whole session

Activities:

General summary of all the previous sessions will be done together with the clients. Questions raised will be answered and all clarifications made. Clients will be encouraged to make conscious effort to put into practice all that had been taught, discussed and explained.

APPENDIX D

TREATMENT PLAN - IPT

Counselling phase - IPT

A total of twelve (12) counselling sessions (twice in a week, for six consecutive weeks) were held. Each session lasted for about 60 minutes.

The treatment manual was from the updated version of "The Guide to Interpersonal Psychotherapy" purchased from the Oxford University Press. The following were the steps taken:

Initial Sessions (Sessions 1-3)

1. Assessed the patients' symptoms as well as their severity after clients had introduced themselves as well as the counsellor, the treatment goals stated and the expected roles of the counsellor as well as the clients discussed. Leaders were chosen and rules and regulations which govern the sessions were set. To assist the patient in understanding the scope and nature of her symptoms, use a scale like the BDI. Tell the patients what the score signifies and let them know that you'll be repeating the scale frequently to monitor how the treatment is doing.
2. A name should be given to the syndrome: "You are suffering from mild to moderate depression." Depression has a fair prognosis despite its sign of hopelessness.
3. The **sick role** should be given to the patient: *"If there are things you can't do because you're feeling depressed, that's not your fault: you're ill."*

4. A **time limit** should be set. Participants should be explained to that IPT is a time-limited treatment that focuses on the relationship between interactions with other people and how she is feeling. You will be meeting for X weekly sessions, and the patient has a good chance of feeling better soon.

   Example: You're suffering from depression, and that seems to have something to do with what's going on in your life, which is the infertility you're facing. We call that a role transition. I suggest that we spend the next six weeks working on solving that difficult life crisis. If you can solve that problem, your depression is likely to lift as well. Does that make sense to you?

5. Need for medication should be evaluated. Prescribing medication may depend on symptom severity, comorbidity, the patient's treatment preference, and other factors. In such cases, consultations and referrals may come in.
6. Interpersonal context should be related to depression:
   a. The manner in which you engage with important people: How near does the sufferer approach other people? How does she vent her rage?
   b. The patient's and their loved ones' expectations; describe how they differ from one another and talk about if they were met.
   c. Positive and negative facets of the connections
   d. The relationship's changes that the patient seeks
7. Pick a primary area of concern, such as grieving, role conflicts, role transitions, or interpersonal deficiencies.

a. Establish therapy objectives after identifying the issue that is connected to the current depression.
b. Identify which significant relationship or component thereof is depression connected with and any variations.

8. Describe IPT's principles. Formulate understanding issues by tying disease to a circumstance in an individual's life.
9. Decide on the treatment's objectives and the specific issue area that will be the emphasis. Obtain the patients' express consent before focusing.
10. Describe the IPT's processes. Stress the need of discussing critical problems with the patient, go through their present interpersonal relationships, and go over the practical components of their treatment (length, confidentiality, frequency, fees, times, and missed appointment policy).

Intermediate Sessions-The Problem Areas (Sessions 4-10)

The first four sessions in this part was used to discuss each of the four IPT problem areas. Additional sessions were allotted to interpersonal deficits and role transitions which involve the infertility as the main reason for the depression in the infertile women. Keep in mind to maintain a supportive therapeutic alliance: Pay attention and empathise.

- As stated in your treatment contract, keep the treatment centered on the focus.
- When necessary, give patients psychoeducation about depression to explain their lack of motivation, shame, etc.
- Pulling for impact.

- Pay attention to how the patient interacted with others.
- What the patient thought, felt, and said.
- If something went wrong, be sympathetic and consider different possibilities.
- In either scenario, relate the patient's emotional state to the interpersonal result.
- Interpersonal choices role-playing
- The sessions are summarised at their end

The following table gives further details of the intermediate phase:

Intermediate Sessions-The Problem Areas				
	Grief/Complicated Bereavement	**Role Disputes**	**Role Transitions**	**Interpersonal Deficits**
Goals	1. Help the grieving process.	1. Determine the conflict.	1. Help people grieve and accept the loss of their former roles.	1. Make the patient feel less lonely.
	2. Assist the patient in rekindling their interests and connections.	2. Look into individual possibilities.	2. Assist the patient in adopting a more positive attitude toward their new role.	2. Encourage the patient to establish new connections.
		3. Adjust expectations or ineffective messages to achieve a satisfactory outcome.	3. Help the participant to restore self-esteem.	

Strategies	Recall the signs and symptoms of depression. Link the onset of the symptoms to the demise of the close companion. Rebuild the patient's connection to the deceased. Examine related emotions (negative as well as positive). As soon as an effect appears, accept it in the space.	Recall the signs and symptoms of depression. Relate the commencement of the symptoms to an outright or covert argument with the patient's current significant other. Identify the dispute's stage: 1. A new agreement (tranquilize the participants to promote resolution). 2.Impasse (to reopen negotiations, create more tension). 3. Dissolving (help the grieving).	Recall the signs and symptoms of depression. Relate depression symptoms to trouble adjusting to a recent change in your life. Review the advantages and disadvantages of the previous and new jobs. Investigate the patient's feelings regarding the loss. Investigate the patient's thoughts about the change itself.	Recall the signs and symptoms of depression. Link issues with social isolation or a lack of fulfillment to depressive symptoms. Examine the positive and negative facets of previous meaningful relationships. Analyze the recurring patterns in your relationships.

		Know how the conflict is related to nonreciprocal role expectations: What are the disputed issues? What are the variations in values and expectations? What choices are there? What is the chance of discovering alternatives? What tools are at our disposal to modify the relationship? Do other partnerships have any similarities? Why does the patient benefit?	Investigate your options in the new position. Realistically assess the damage. Encourage the right expression of emotion. Encourage the growth of a social network and the acquisition of new skills needed for a new position.	Talk about the patient's sentiments both ways regarding the therapist, and encourage them to look for analogies in other relationships.

Termination Phase (Sessions 11-12)

Review the results of the prior sessions with the patients and make sure they take credit for any change by asking, "Why are you better?" discussed what had been achieved and what needed to be taken into account. addressed termination a few weeks prior to the scheduled date.

1. Clearly address termination.

2. Recognize that a job termination is a period of (healthy) melancholy and a change in roles.

3. Work to have the patient recognize their own competence.

4. Handle the lack of response:

• Reduce the patients' self-shame by placing the blame on the therapy.

• Highlight available alternative therapies.

5. Determine whether more or ongoing treatment is necessary.

The treatment agreement is renegotiated.

APPENDIX E

RESULTS OF RELIABILITY TEST

BDI-II

Overall Reliability.

Statistics	
Cronbach's Alpha	N of Items
.816	12

Source: Field Survey, (2021)

MEASURING IMPLANTATION

Overall

Statistics	
Cronbach's Alpha	N of Items
.779	12

Source: Field Survey, (2021)

APPENDIX F

PARTICIPANT INFORMATION SHEET

Principal Investigator-NANA YAW OSEI
Address-DEPARTMENT OF GUIDANCE AND COUNSELLING, UCC,
0244-441690, nanayok2002@yahoo.com]

Background and Purpose of Research

Infertility and its associated problems (psychosocial, financial, sexual, risk with treatments, etc.) are enormous for the affected people particularly women. It has been shown in many studies that there is high depression among many women with infertility and once they are helped through counselling for their depression levels to reduce, it helps such women achieve higher implantation/pregnancy. The main purpose of this study, therefore, is to find out implantation/pregnancy levels among depressed infertile women in Ghana after they have been taken through two (2) counselling therapies, Cognitive Behavioural and Interpersonal therapies.

Nature of Research

Women with infertility who have high depression levels will be provided with therapies and after assist them to do In Vitro Fertilisation (IVF) at City of Hope Medical Complex in order to determine implantation among them. The counselling procedures will involve applying techniques of CBT and IPT to two separate groups of infertile women with a third group serving as control. The study employs the experimental research design. This means that participants will be made to experience some form of training. Participants are expected to take part in twelve sessions each of CBT and IPT lasting about one hour for each session. Questionnaire known as the Beck's Depression Inventory (BDI) will be given to women facing infertility and based on their scores, they will be contacted and their consent would be sought to place them together with others in three separate groups having about 15 women in each group. The counselling sessions will take place at the premises of the 37 Military Hospital in Accra. Participants are expected to contribute to the group discussions. An "Implantation Questionnaire" will also be administered to determine the number of participants who will achieve implantation. Confidentiality of issues discussed will be encouraged.

You will be given the questionnaire to complete on your own. However, I would be here to help you if you ran into any problems filling them out. Upon completion, I will personally collect your questionnaire. You are free not to answer any of the questions. Only myself and my supervisors will have access to the data because it is considered confidential.

It is expected that the filling of the questionnaire will take between 5-15minutes.

Participants involvement:

- **Duration/what is involved:** The procedure will first involve you filling a questionnaire to determine whether you're confronted with depression. If found to be depressed by the scale, you will be taken through 12 sessions of counselling in a group with others after which you will fill the questionnaire again to see if the depressive level has gone down. You will be asked questions about you and your partner's fertility levels and your hospital's folder is likely to be reviewed. Finally, you will be required to do In Vitro Fertilisation (IVF) at City of Hope Medical Complex to determine implantation (pregnancy). An assistance of a Professional Medical Personnel of 37 Military Hospital will be

sought to refer you to City of Hope for the IVF. The referral will be required because 37 Military Hospital does not presently do IVF. The entire process is expected to last for about three (3) months.

- **Potential Risks and Discomforts:** Respondents may find some of the questions on the questionnaires embarrassing such as: "I am self-disgusted"; "I believe I'm looking ugly". Participants who will require interpretation of items on the questionnaire risk their personal and intimate fertility issues being made known to the 'interpreters'. However, the interpreters are well trained on issues of confidentiality.

- **Possible Benefits:** Participants are probably going to learn more about their status regarding depression. As they answer the questions they will begin to realise some of the issues that exist in their lives which if not addressed may lead to uncontrollable or difficult to control forms of depression. This can serve as motivation to those who report satisfaction in depression. For those whose scores reflect dissatisfaction or higher forms of depression, they will benefit from knowing what their status are and if they permit me, I will meet with them privately at the premises of 37 Military Hospital to discuss the essence of counselling to improve their levels of depression. Also, I have secured an agreement with the Management of City of Hope Medical Complex on highly significant rebate on In Vitro Fertilisation (IVF) treatment and participants who desire for the treatment can benefit from it. Lastly, the research findings will be published without any traces of you to add to knowledge.

- **Costs:** You will be required to find your own means of transport to the venue for the counselling and also to pay for the highly discounted IVF cost.

- **Compensation:** You will be given a pen to answer the questions with and you will be allowed to take the pen as a gift after completion of the questionnaire. You will also be provided with snacks during the counselling sessions.

- **Confidentiality:** "I will ensure that information about you and/or your partner is protected to the best of my ability. Your name, address and personal information disclosed will not be mentioned in any report".

- **Voluntary Involvement:** Because getting involved is completely optional, individuals are free to refuse to take part at any time without incurring any penalties or having to provide an explanation.

- **Outcome and Feedback:** The data received will be analysed. For women interested in their scores, they will be given feedback on their scores and its interpretation with regard to their levels of depression. Finally, findings of the study will be shared to all interested participants through their email.

- **Funding Information:** The study/research is personal funding.

- **Sharing of participants information/Data:** The study is part of my academic work and therefore the University of Cape Coast solely owns data that will be generated from the study.

Contacts for Further Clarification/Questions

If you have any questions about the study, its benefits and risks, or your rights as a research participant, please get in touch with me, Nana Yaw Osei, on mobile number 024-4441690; email: nanayok2002@yahoo.com *or my Principal Supervisor, Prof. Joshua A. Omotosho on 024-3784739.*

Your rights as a Participant

This research has been reviewed and approved by the Institutional Review Boards of University of Cape Coast and the 37 Military Hospital. If you have any questions about your rights as a research participant you can contact the Administrator of any of the institutions as listed below:

i. Cape Coast University's Ethical Review Board (UCCIRB). IRB Office can be reached between the hours of 8:00 am and 4:30 pm at 033-2133172 and 024-4786680, or by email at irb@ucc.edu.gh.

ii. 37 Military Hospital Institutional Review Board. The office of 37MH-IRB is opened between the hours of 7:30 am and 2:00 p.m. Their phone number is 059-1759506 and email address: irbmilhosp@gmail.com

APPENDIX G

CONSENT FORM

STATEMENT FROM PARTICIPANTS

I certify that I have read the Participants' Information Sheet's purpose and contents and have had all questions adequately answered in a language I can understand (Twi, Ga, Ewe, Hausa, or other). I am fully aware of the information contained below, any possible ramifications, and my right to change my mind or opt out of the study even after I have signed this document.
I willingly accept to participate in this study.

Participant's Name…….

Signature/Thumb Print ……

Date:…….

STATEMENT FROM INTERPRETERS

To the best of my abilities, I communicated to the aforementioned participant in the appropriate language (Twi, Ga, Ewe, Hausa, or other) the purpose and contents of the Participants' Information Sheet.

To the participant's satisfaction, all queries, pertinent clarifications, and responses were properly translated.

Interpreter's Name……

Signature/Thumb Print ……

Date:……

Contact Details:

WITNESS' STATEMENT

I was there when the participant's language of choice (Twi, Ga, Ewe, Hausa, etc.) was used to read and fully explain the purpose and contents of the participant information sheet.

Before willingly choosing to participate in the research, she was given the chance to ask questions or seek clarifications, which were duly addressed and satisfactorily answered.

Name:_____

Signature/Thumb Print:_____

Date:_____

STATEMENT OF INVESTIGATOR AND SIGNATURE

I attest that the participant was given adequate opportunity to read about the study and understand it. The participant's queries and requests for explanations have all been answered.

Name of Researcher …….

Signature …….

Date…….

UNIVERSITY OF CAPE COAST
COLLEGE OF EDUCATION STUDIES
FACULTY OF EDUCATIONAL FOUNDATIONS
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UNIVERSITY POST OFFICE
CAPE COAST, GHANA

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26th August, 2021

TO WHOM IT MAY CONCERN

LETTER OF INTRODUCTION

We introduce to you, Nana Yaw Osei a student pursuing a Ph.D Programme in Guidance and Counselling at the Department of Guidance and Counselling of the University of Cape Coast. As a requirement, he is to submit a Thesis on the topic: ***"Effects of Cognitive Behavioural and Interpersonal Therapies in Achieving Implantation in Depressed Infertile Women in Ghana".*** We are by this letter affirming that, the information he will obtain from your Institution will be solely used for academic purposes.

We would be most grateful if you could provide him the necessary assistance.

Thank you.

Dr. Stephen Doh Fia
HEAD OF DEPARTMENT

UNIVERSITY OF CAPE COAST

COLLEGE OF EDUCATION STUDIES

ETHICAL REVIEW BOARD

UNIVERSITY POST OFFICE
CAPE COAST, GHANA

Our Ref: CES-ERB/ucc-edu/vs/21-75

Your Ref: .....

Date: 2nd September, 2021

Dear Sir/Madam,

ETHICAL REQUIREMENTS CLEARANCE FOR RESEARCH STUDY

The bearer, Nana Yaw Osei ....., Reg. No. ~~EF~~/gec/19/0002 is an M.PHIL. / Ph.D. student in the Department of Guidance and Counselling ..... in the College of Education Studies, University of Cape Coast, Cape Coast, Ghana. He / ~~She~~ wishes to undertake a research study on the topic:

Effects of Cognitive Behavioural and Interpersonal therapies in achieving implantation in depressed infertile women in Ghana.

The Ethical Review Board (ERB) of the College of Education Studies (CES) has assessed his/~~her~~ proposal and confirm that the proposal satisfies the College's ethical requirements for the conduct of the study.

In view of the above, the researcher has been cleared and given approval to commence his/~~her~~ study. The ERB would be grateful if you would give him/~~her~~ the necessary assistance to facilitate the conduct of the said research.

Thank you.
Yours faithfully,

Prof. Linda Dzama Forde
(Secretary, CES-ERB)

Chairman, CES-ERB
Prof. J. A. Omotosho
jomotosho@ucc.edu.gh
0243784739

Vice-Chairman, CES-ERB
Prof. K. Edjah
kedjah@ucc.edu.gh
0244742357

Secretary, CES-ERB
Prof. Linda Dzama Forde
lforde@ucc.edu.gh
0244786680

Institutional Review Board
37 Military Hospital
Neghelli Barracks
ACCRA

Tel: 059 1759506
Email: irbmilhosp@gmail.com

17 January 2022

ETHICAL CLEARANCE

37MH-IRB/FP/IPN/547/21

On 11 January 2022 the 37 Military Hospital (37MH) Institutional Review Board (IRB) approved your protocol.

TITLE OF PROTOCOL: Effects of Cognitive Behavioural and Interpersonal Therapies in Achieving Implantation in Depresses Infertile Women In Ghana

PRINCIPAL INVESTIGATOR: Nana Yaw Osei

Please note that a final review report must be submitted to the Board at the completion of the study.

Please report all serious adverse events related to this study to 37MH-IRB within seven (7) days verbally and fourteen (14) days in writing.

This certificate is valid till 10 January 2023.

DR EDWARD ASUMANU
(37MH-IRB, Vice Chairman)

INSTITUTIONAL REVIEW BOARD
17 JAN 2022
37 MILITARY HOSPITAL-ACCRA

Cc: Brig Gen NA Obodai
Commander, 37 Military Hospital

The number and the date of this
Letter should be quoted in a reply
Our Ref.:
Your Ref. No.
DATE: **December 09, 2021**

CITY OF HOPE MEDICAL COMPLEX
P O Box CS 9310, Tema, Ghana
Tel: +233 54 349 5200
Tel: +233 30 297 1562
chmc2.ghana@gmail.com

THE CHAIRPERSON
ETHICAL REVIEW BOARD
UNIVERSITY OF CAPE COAST
CAPE COAST

Dear Sir/Madam,

COLLABORATION WITH NANA YAW OSEI

Nana Yaw Osei is a PhD student in Guidance and Counseling with the University of Cape Coast (UCC). He is conducting a research on the **"Effects of Cognitive Behavioral and Interpersonal Therapies in Achieving Implantation in Depressed Infertile Women in Ghana"** as part of his programme.

The study participants will undergo In Vitro Fertilization (IVF) treatment after some counseling therapies and City of Hope Medical and Fertility Centre has agreed to do the IVF for the participants under the terms and agreement with his organization, the Walking Egg Medical Centre.

We would, therefore, be glad if you could provide him with the ethical clearance for the said study, please.

Yours faithfully,

Dr. Kenneth Frimpong
President & CEO

CITY OF HOPE MEDICAL COMPLEX - OPP EMEF ESTATE - LASHIBI ACCRA - KF